

United States of America
Department of Transportation -- Federal Aviation Administration

Supplemental Type Certificate

IMPORT

Number SR02730NY

This certificate issued to Aero Design Ltd.
2013 - 39th Avenue North East
Calgary, Alberta, T2E 6R7
Canada

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 7/29 of the Civil Air/Federal Aviation Regulations.

Original Product -- Type Certificate Number : *

Make : *

*See attached FAA Approved Model List (AML) No. SR02730NY for a list of approved models and applicable airworthiness regulations.

Model : *

Description of Type Design Change:

Configuration A - Quick Release Mounting Provisions:

Installation of Quick Release Mounting Provisions on the right or left side in accordance with AERO Design Ltd. Installation Document 75102 Revision 0, as listed in Document Control List DCL751-1 Revision 1, dated September 15, 2008, TCCA approved September 30, 2008, or later TCCA approved revisions.

(See Continuation Sheet 2 of 2)

Limitations and Conditions:

1. Installation of Configuration A is a prerequisite for the installation of Configuration B.
2. Installation of Configuration A is a prerequisite for the installation of Configuration C.
3. Configuration A may remain installed on aircraft when Configuration B or C is removed.
4. Eligibility limitations of cargo basket modifications are noted on the drawings listed in AERO Design Ltd. Document Control List DCL704 Revision 3, dated July 31, 2008.

(See Continuation Sheet 2 of 2)

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application : March 19, 2009

Date reissued :

Date of issuance : September 11, 2009

Date amended :



By direction of the Administrator

[Signature]
(Signature)

Anthony Socias
Manager
New York Aircraft Certification Office

(Title)

SENDER RETAIN THIS COPY / COPIE DE L'EXPÉDITEUR

SENDER ACCOUNT NO. N° DE COMPTE DE L'EXPÉDITEUR 4367155		IMPORTANT - TÉLÉPHONE (403) 250 8027	
SENDER (FROM) / EXPÉDITEUR (DE) AERO DESIGN		MO DY/JR YR/AN 04/27/09	
STREET ADDRESS / ADRESSE (N° ET RUE) 2013 39 AVE NE		APT., SUITE / APP., BUREAU	
CITY / VILLE CALGARY	PROV./STATE/ÉTAT AB	POSTAL / ZIP T2E 6R7	
RECEIVER (TO) / DESTINATAIRE (À) TRANSPORT CANADA			
STREET ADDRESS / ADRESSE (N° ET RUE) 1100 - 9700 JASPER AVENUE		APT., SUITE / APP., BUREAU	
CITY / VILLE EDMONTON	PROV./STATE/ÉTAT ALBERTA	POSTAL / ZIP T5J 4E6	
ATTN: (NAME / DEPT.) / À L'ATTENTION DE (NOM / SERVICE) JACK STAAL		IMPORTANT - TÉLÉPHONE (780) 495 5227	
DESCRIPTION (INCLUDING DANGEROUS GOODS / INCLUANT MARCHANDISES DANGEREUSES) DOCUMENT			
SENDER REFERENCE (IF ANY) / REF. DE L'EXPÉD.		PICK UP / CUEILLETTE - N° DE CONF. 8900 8207 0002	

SENDER SIGNATURE / SIGNATURE DE L'EXPÉDITEUR

X *[Signature]* **X**
 SEE CONDITIONS OF CARRIAGE ON REVERSE / CONDITIONS DE TRANSPORT AU VERSO

1746040

SHIP MODE / MODE DE TRANSPORT	
AIR AÉRIEN <input type="checkbox"/>	GROUND ROUTIER <input checked="" type="checkbox"/>
PKG / EMBAL.	SERVICE
PUR-O-LETTER <input checked="" type="checkbox"/>	9 AM <input type="checkbox"/>
PUR-O-PAK <input type="checkbox"/>	10:30 AM <input checked="" type="checkbox"/>
OTHER AUTRE <input type="checkbox"/>	SAT. SAM. <input type="checkbox"/>
PAYMENT / PAIEMENT	
CASH COMPTANT <input type="checkbox"/>	CREDIT CARD CARTE DE CRÉDIT <input type="checkbox"/>
RECEIVER OR THIRD PARTY ACCOUNT NO. / N° DE COMPTE DU DESTINATAIRE OU TIERS	
RECEIVER DESTINATAIRE <input type="checkbox"/>	3RD PARTY TIERS <input type="checkbox"/>
SENDER EXPÉDITEUR <input checked="" type="checkbox"/>	
SHIPMENT / DÉTAILS / EXPÉDITION	
#/Nbre PCS (4 MAXIMUM) 1	WEIGHT / POIDS SUBJ. TO CORR. / SUJET À CORR. KG 1 LB 1
DECLARED VALUE / VALEUR DÉCLARÉE (SURCHARGE APPLIES OVER \$100) (SUPPLÈMENT AU-DESSUS DE 100 \$) \$ 5,000 MAX. MAX 5 000 \$	
SEE CONDITIONS OF CARRIAGE ON REVERSE / CONDITIONS DE TRANSPORT AU VERSO	

 BILL OF LADING NO.
 -NOT NEGOTIABLE
 N° DE CONNAISSANCE
 -NON NÉGOCIABLE

2972 480 0411

Purolator
 www.purolator.com 1 888 SHIP-123

COURIER INITIALS INITIALES DU COURRIER <input type="checkbox"/>	COURIER ROUTE ITINÉRAIRE DU COURRIER 265	MO DY/JR YR/AN 4/27
NO./N° TYPE <input type="checkbox"/> VISA <input type="checkbox"/> MC <input type="checkbox"/> AMEX		EXP. DATE D'EXP.

RECEIVER OR THIRD PARTY ACCOUNT NO. / N° DE COMPTE DU DESTINATAIRE OU TIERS	CHARGES FRAIS TOTAL AMOUNT / MONTANT TOTAL
THIRD PARTY BILLING NAME & ADDRESS / FACTURATION À UN TIERS (NOM & ADRESSE)	

 LIMITATION OF LIABILITY - IMPORTANT - PLEASE READ
 THE AMOUNT OF ANY LOSS OR DAMAGE FOR WHICH THE
 CARRIER MAY BE LIABLE SHALL NOT EXCEED \$2.00 PER
 POUND (OR \$4.41 PER KILOGRAM) COMPUTED ON THE
 TOTAL WEIGHT OF THE SHIPMENT UNLESS A HIGHER
 VALUE IS DECLARED ON THE FACE OF THE BILL OF LADING
 BY THE CONSIGNOR (SENDER). MAXIMUM DECLARED
 VALUE SHALL NOT EXCEED \$5,000. N.B. NOTE CAREFULLY
 CONDITIONS ON BACK HEREOF INCLUDING LIMITATIONS
 AND EXCLUSIONS OF CARRIER'S LIABILITY, WHICH ARE
 HEREBY ACCEPTED.

 LIMITATION DE RESPONSABILITÉ - IMPORTANT - LISEZ S.V.P.
 LE MONTANT DE TOUTE PERTE OU DOMMAGE DONT LE
 TRANSPORTEUR POURRAIT ÊTRE RESPONSABLE NE DOIT PAS
 EXCÉDER 2.00 \$ LA LIVRE (OU 4.41 \$ LE KILOGRAMME), CALCULÉ
 SUR LE POIDS TOTAL DE L'EXPÉDITION, À MOINS QU'UNE VALEUR
 SUPÉRIEURE N'AIT ÉTÉ DÉCLARÉE SUR LE RECTO DU
 CONNAISSANCE PAR L'EXPÉDITEUR. LA VALEUR DÉCLARÉE
 MAXIMALE NE DÉPASSERA PAS 5 000 \$. N.B. VEUILLEZ PRENDRE
 CONNAISSANCE DES CONDITIONS AU VERSO, Y COMPRIS LES
 LIMITATIONS ET EXCLUSIONS DE RESPONSABILITÉ DU
 TRANSPORTEUR, QUI SONT ACCEPTÉES PAR LES PRÉSENTES.

 PLEASE REFER TO BILL OF LADING NUMBER FOR SHIPMENT STATUS / INQUIRIES.
 POUR TOUT RENSEIGNEMENT, VEUILLEZ NOUS COMMUNIQUER LE NUMÉRO DE
 CONNAISSANCE.

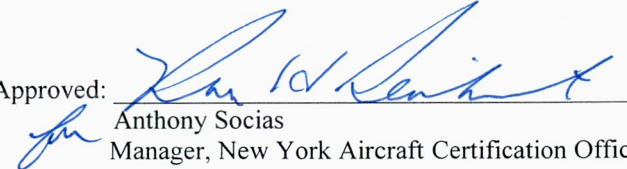
SENDER RETAIN THIS COPY / COPIE DE L'EXPÉDITEUR

FAA APPROVED MODEL LIST (AML) NUMBER SR02730NY
AERO DESIGN LTD.
FOR
INSTALLATION OF QUICK RELEASE MOUNTING PROVISIONS/CARGO BASKET/STEP

Issue Date: September 11, 2009

ITEM	PART	REGULATION	AIRCRAFT MAKE	AIRCRAFT MODEL	ORIGINAL TYPE CERTIFICATE NUMBER	AML AMENDMENT DATE
1	7	Civil Air	Bell	205A-1	H1SW	
2	29	Federal Aviation	Bell	212 412 412EP 412CF	H4SW	

FAA Approved: _____


Anthony Socias
Manager, New York Aircraft Certification Office

**NEW ENGLAND REGION
NEW YORK AIRCRAFT CERTIFICATION OFFICE
1600 STEWART AVENUE, SUITE 410
WESTBURY, NEW YORK 11590**

**INFORMATION CONCERNING YOUR RESPONSIBILITY AS HOLDER OF A
SUPPLEMENTAL TYPE CERTIFICATE ISSUED TO A CANADIAN APPLICANT**

This STC is official indications of FAA approval of your installation and may be used to authorize identical installation on other aircraft of the same model, subject to the limitation noted in the STC. It may be transferred, or otherwise made available to another party by means of a licensee arrangement; however, you are requested to advise this office when you transfer or grant licensee rights to the STC in order that we may take the necessary recording or reissuance action.

If you plan to manufacture and sell parts for installation on type certificated aircraft, please review FAR 21.502, which is applicable to parts imported into the U.S.

A copy of the STC and required documents should accompany each kit and installation. Also, your attention is directed to the limitations and conditions specified in the STC.

As recipient of this approval, except as provided in FAR21.3(d), you are required to report any failure, malfunction, or defect in any product or part manufactured by you that you have determined has resulted or could result in any of the occurrences listed in FAR 21.3(c).

The report should be communicated initially by telephone and subsequently in writing to the Manager, New York Aircraft Certification Office, telephone (516) 228-7300, mailing address: 1600 Stewart Avenue, Suite 410, Westbury, New York 11590. This first contact should take place within 24 hours after it has been determined that the failure required to be reported has occurred.

FAA Form 8010-4, Malfunction or Defect Report, or any other appropriate format is acceptable in transmitting the required details.



Anthony Socias
Manager,
New York Aircraft Certification Office

copy C-08-0892

MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD751, Rev. 1

1. NAME AND ADDRESS OF APPLICANT:	2. IDENTIFICATION OF PRODUCT	
AERO Design Ltd. 2013 - 39th Avenue NE Calgary, Alberta, Canada T2E 6R7	MAKE: Bell Helicopter (Textron)	MODEL: 205A-1, 205B, 212, 412 series, and UH-1 series
ALL CORRESPONDANCE TO: AERO Design Ltd. 2013 - 39th Avenue NE Calgary, Alberta T2E 6R7	SERIAL No.: All eligible	REGISTRATION: All eligible

3. REQUEST FOR:	
A. SUPPLEMENTAL TYPE CERTIFICATE (STC)	<input type="checkbox"/>
B. STC/STA REVISION	<input type="checkbox"/> STC/STA No.
C. LIMITED SUPPLEMENTAL TYPE CERTIFICATE (LSTC)	<input type="checkbox"/>
D. LIMITED STC/STA REVISION	<input type="checkbox"/> LSTC/LSTA No.
E. F.A.A. SUPPLEMENTAL TYPE CERTIFICATE	<input checked="" type="checkbox"/>
F. F.A.A. STC REVISION	<input type="checkbox"/> STC No.
G. FAMILIARIZATION OF F.A.A. STC	<input type="checkbox"/> STC No.
H. REPAIR DESIGN APPROVAL (RDC)	<input type="checkbox"/>
I. PARTS DESIGN APPROVAL (PDA)	<input type="checkbox"/>

4. TITLE OF MODIFICATION OR REPAIR:
Quick Release Cargo Basket Installation
5. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR:
Installation of Cargo Basket on right side of the helicopter. The mounting provisions are aluminum beams that attach to the existing hard points below the cabin of the helicopter. The Cargo Basket can be installed and removed from the beams without tools. An option to install a passenger step (when the basket is not mounted) is available.


6. APPLICABLE TYPE APPROVAL (TA) OR TYPE CERTIFICATE (TC) DOCUMENTS:		
A. TA NO. <u>H-86, H-104 (205)</u>	B. TC No. <u>H1SW (212 & 412)</u>	C. OTHER <u>UH-1 (Restricted Category)</u>

7. PROPOSED BASIS OF APPROVAL:		
A. SAME AS TA <input checked="" type="checkbox"/>	B. SAME AS TC <input checked="" type="checkbox"/>	C. OTHER <input type="checkbox"/> (Please specify) _____

8. DOCUMENTATION CHECKLIST	REQUIRED		FOR DOT USE ONLY		
	YES	NO	RECEIVED		
			YES	NO	DATE
COMPLIANCE PROGRAM	X				
MASTER DRAWING LIST	X				
FLIGHT MANUAL SUPPLEMENT	X				
MAINTENANCE MANUAL SUPPLEMENT		X			
INSTRUCTIONS FOR CONTINUING AIRWORTHINESS	X				
ENGINEERING REPORTS	X				
DESIGN DRAWINGS		X			
MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS	X				
ELECTRICAL LOAD ANALYSIS		X			
DRAFT STC, LSTC OR RDA		X			
WEIGHT AND MOMENT CHANGE	X				
FLIGHT TEST DATA	X				
OTHER (Specify)		X			

9. APPLICANT'S REMARKS:
STC based on Transport Canada STC # SH07-56.

10. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4.		
AERO Design Ltd.		
PER: 	Consultant _____	29 October, 2008
SIGNATURE OF APPLICANTS	TITLE	DATE

11.	
	2009 JAN 08
SIGNATURE OF REGIONAL ENGINEER	DATE



Transport
Canada

Transports
Canada

1100-9700 Jasper Avenue
Edmonton, Alberta T5J 4E6

Your file Votre référence

September 24, 2009

Our file Notre référence
C-08-0892
SH07-56

Aero Design Ltd.
2013 39th Avenue North East
Calgary, Alberta
Canada, T2E 6R7

ATTENTION: EDWARD BURGOIN

Dear Sir:

SUBJECT:	Approval of	Installation of Quick Release Mounting Provisions/Cargo Basket/Step on the right side or the left hand side of the helicopter.
	FAA STC:	FAA STC SR02730NY
	Aircraft:	BELL 205A-1, 212, 412, 412CF, 412EP
	FAA STC Holder:	Aero Design Ltd.

Enclosed is the original FAA Supplemental Type Certificate SR02730NY and information concerning your responsibility as a holder of a Supplemental Type Certificate issued to a Canadian Applicant.

FAA STC SR02730NY is based on Issue 2 of Canadian STC SH07-56.

Yours truly,

J. Staal
Aircraft Certification Engineering Technologist
Prairie and Northern Region
Phone: 780-495-5227
Facs: 780-495-7963

Encl.

Transport
CanadaTransports
Canada#1100, 9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6FACSIMILE
6 Pages
Sept 25/09**FACSIMILE**Date 25-Sep-09No. of pages (including cover sheet) 6Our File: C-08-0892
SH07-56 - Issue 2

Your File: _____

To: AERO DESIGN LTD.ATTN: TED BURGOINPhone (403) 250-8027Fax Phone (403) 250-8333From Debbie DubykPhone 780-495-7412Fax Phone 780-495-7963

SUBJECT: FAA STC SR02730NY - INSTALLATION OF QUICK RELEASE MOUNTING PROVISIONS/CARGO BASKET/STEP ON THE RIGHT SIDE OR LEFT HAND SIDE OF THE HELICOPTER - BELL 205A-1, 212, 412, 412CF, 412EP ISSUED TO AERO DESIGN LTD. - BASED ON ISSUE 2 OF CANADIAN STC SH07-56

Hi Ted:

Please find attached an advance copy of the above noted FAA STC which was received from the FAA. Also attached is an advance copy of our cover letter to you concerning this FAA STC.

The original FAA STC SR02730NY and our cover letter dated September 24, 2009, will be sent to you in the mail next week.

Thank you.

Debbie Dubyk

Operational Support Assistant

Canada

Transport
CanadaTransports
Canada1100-9700 Jasper Avenue
Edmonton, Alberta T5J 4E6

Your file Votre référence

September 24, 2009

Our file Notre référence

C-08-0892

SH07-56

Aero Design Ltd.
2013 39th Avenue North East
Calgary, Alberta
Canada, T2E 6R7**ATTENTION: EDWARD BURGOIN**

Dear Sir:

**SUBJECT: Approval of Installation of Quick Release Mounting
Provisions/Cargo Basket/Step on the right side
or the left hand side of the helicopter.**

FAA STC: FAA STC SR02730NY

Aircraft: BELL 205A-1, 212, 412, 412CF, 412EP

FAA STC Holder: Aero Design Ltd.

Enclosed is the original FAA Supplemental Type Certificate SR02730NY and information concerning your responsibility as a holder of a Supplemental Type Certificate issued to a Canadian Applicant.

FAA STC SR02730NY is based on Issue 2 of Canadian STC SH07-56.

Yours truly,

J. Staal
Aircraft Certification Engineering Technologist
Prairie and Northern Region
Phone: 780-495-5227
Facs: 780-495-7963

Encl.

Canada

United States of America
 Department of Transportation -- Federal Aviation Administration
Supplemental Type Certificate
IMPORT

Number SR02730NY

This certificate issued to Aero Design Ltd.
 2013 - 39th Avenue North East
 Calgary, Alberta, T2E 6R7
 Canada

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified herein meets the airworthiness requirements of Part 7129 of the Civil Air/Federal Aviation Regulations.

Original Product -- Type Certificate Number : *

Make : *

*See attached FAA Approved Model List (AML) No. SR02730NY for a list of approved models and applicable airworthiness regulations.

Model : *

Description of Type Design Change:

Configuration A - Quick Release Mounting Provisions:

Installation of Quick Release Mounting Provisions on the right or left side in accordance with AERO Design Ltd. Installation Document 75102 Revision 0, as listed in Document Control List DCL751-1 Revision 1, dated September 15, 2008. TCCA approved September 30, 2008, or later TCCA approved revisions.

(See Continuation Sheet 2 of 2)

Limitations and Conditions:

1. Installation of Configuration A is a prerequisite for the installation of Configuration B.
2. Installation of Configuration A is a prerequisite for the installation of Configuration C.
3. Configuration A may remain installed on aircraft when Configuration B or C is removed.
4. Eligibility limitations of cargo basket modifications are noted on the drawings listed in AERO Design Ltd. Document Control List DCL704 Revision 3, dated July 31, 2008.

(See Continuation Sheet 2 of 2)

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application : March 19, 2009

Date reissued :

Date of issuance : September 11, 2009

Date amended :



By direction of the Administrator

Anthony Socias
 (Signature)

Anthony Socias
 Manager
 New York Aircraft Certification Office

(Title)

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

United States of America
Department of Transportation -- Federal Aviation Administration
Supplemental Type Certificate
(Continuation Sheet)
Number SR02730NY

Description of Type Design Change: (Continued)

Configuration B - Quick Release Cargo Basket Installation:

Installation of Quick Release Cargo Basket on the right or left side in accordance with AERO Design Ltd. Installation Document 75101 Revision 1, as listed in Document Control List DCL751-1 Revision 1, dated September 15, 2008, TCCA approved September 30, 2008, or later TCCA approved revisions.

Configuration C - Quick Release Step Installation:

Installation of Quick Release Step on the right or left side in accordance with AERO Design Ltd. Installation Document 80001 Revision 0, as listed in Document Control List DCL800-1 Revision 0, dated September 15, 2008, TCCA approved September 30, 2008, or later TCCA approved revisions.

Cargo Basket Modifications:

Modifications to the cargo basket configuration are eligible in accordance with AERO Design Ltd. Document Control List DCL704 Revision 3, dated July 31, 2008, TCCA approved September 30, 2008, or later TCCA approved revisions.

Limitations and Conditions: (Continued)

5. AERO Design Ltd. Rotorcraft Flight Manual Supplement FMS751.91, Revision 1, dated July 16, 2008, TCCA approved September 30, 2008, or later TCCA approved revisions is required to all installation configurations.
6. AERO Design Ltd. Instructions for Continued Airworthiness ICA 751.90 Revision 1, dated November 18, 2008, TCCA accepted August 14, 2009, or later TCCA accepted revisions is required with the installation of the quick release cargo basket.
7. AERO Design Ltd. Instructions for Continued Airworthiness ICA 800.90 Revision 0, dated July 17, 2008, TCCA accepted September 30, 2008, or later TCCA accepted revisions is required with the installation of the quick release step.
8. The installer must determine whether this design change is compatible with previously approved modifications.
9. If the holder agrees to permit another person to use this certificate to alter a product, the holder must give the other person written evidence of that permission.

.....END.....

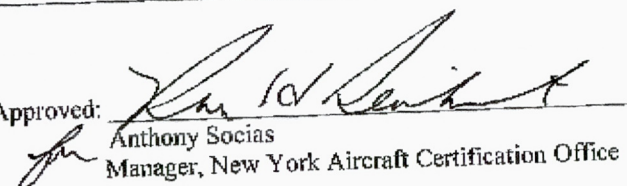
Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

FAA APPROVED MODEL LIST (AML) NUMBER SR02730NY
AERO DESIGN LTD.
FOR
INSTALLATION OF QUICK RELEASE MOUNTING PROVISIONS/CARGO BASKET/STEP

Issue Date: September 11, 2009

ITEM	PART	REGULATION	AIRCRAFT MAKE	AIRCRAFT MODEL	ORIGINAL TYPE CERTIFICATE NUMBER	AML AMENDMENT DATE
1	7	Civil Air	Bell	205A-1	H1SW	
2	29	Federal Aviation	Bell	212 412 412EP 412CF	H4SW	

FAA Approved:


 Anthony Socias
 Manager, New York Aircraft Certification Office

NEW ENGLAND REGION
NEW YORK AIRCRAFT CERTIFICATION OFFICE
1600 STEWART AVENUE, SUITE 410
WESTBURY, NEW YORK 11590

**INFORMATION CONCERNING YOUR RESPONSIBILITY AS HOLDER OF A
SUPPLEMENTAL TYPE CERTIFICATE ISSUED TO A CANADIAN APPLICANT**

This STC is official indications of FAA approval of your installation and may be used to authorize identical installation on other aircraft of the same model, subject to the limitation noted in the STC. It may be transferred, or otherwise made available to another party by means of a licensee arrangement; however, you are requested to advise this office when you transfer or grant licensee rights to the STC in order that we may take the necessary recording or reissuance action.


If you plan to manufacture and sell parts for installation on type certificated aircraft, please review FAR 21.502, which is applicable to parts imported into the U.S.

A copy of the STC and required documents should accompany each kit and installation. Also, your attention is directed to the limitations and conditions specified in the STC.

As recipient of this approval, except as provided in FAR 21.3(d), you are required to report any failure, malfunction, or defect in any product or part manufactured by you that you have determined has resulted or could result in any of the occurrences listed in FAR 21.3(c).

The report should be communicated initially by telephone and subsequently in writing to the Manager, New York Aircraft Certification Office, telephone (516) 228-7300, mailing address: 1600 Stewart Avenue, Suite 410, Westbury, New York 11590. This first contact should take place within 24 hours after it has been determined that the failure required to be reported has occurred.

FAA Form 8010-4, Malfunction or Defect Report, or any other appropriate format is acceptable in transmitting the required details.



Anthony Socias
Manager,
New York Aircraft Certification Office



U.S. Department
of Transportation
**Federal Aviation
Administration**

Engine & Propeller Directorate

New York Aircraft Certification Office
1600 Stewart Avenue
4th Floor, Suite 410
Westbury, NY 11590
(516) 228-7300, Fax (516) 794-5531

SEP 16 2009

Mr. Jack Staal
Engineering Technologist – Aircraft Certification
Transport Canada Civil Aviation (TCCA)
1100-9700 Jasper Avenue
RAED
Edmonton, Alberta T5J 4E6
Canada

Subject: Issuance of Supplemental Type Certificate (STC) SR02730NY

Dear Mr. Staal:

In recognition of the TCCA Supplemental Type Certificate SH07-56 Issue No. 2, dated September 30, 2008 for the installation of Quick Release Mounting Provisions/Cargo Basket/Step on the right or left side of Bell 205A-1, 212, 412, 412CF and 412EP model aircraft, and the existing Bilateral Aviation Safety Agreement (BASA) Implementation Procedures for Airworthiness between the United States and Canada, we are pleased to accept the TCCA Statement of Compliance that compliance has been demonstrated with the FAA Type Certificate H1SW and H4SW, and therefore we have issued FAA Supplemental Type Certificate (STC) SR02730NY, dated September 11, 2009 to Aero Design Ltd..

All mandatory inspections/modifications and related service bulletins issued in the future against this STC model must be forwarded to the following:

Federal Aviation Administration
Airworthiness Programs Branch
AIR-140
PO Box 26460
Oklahoma City, OK 73125
USA

Telephone: 405-954-4103
Facsimile: 405-954-4104

In accordance with the US/Canada bilateral relationship using TCCA compliance to the maximum extent, this STC includes reference to documents that include the words "or later TCCA approved/ accepted revisions". It is expected that as State of Design responsible for the STC, TCCA will coordinate any major/significant changes, as deemed appropriate, with the FAA prior to TCCA approval/acceptance.

Please forward the enclosed STC and a copy of "Information Concerning Your Responsibility as a Holder of A Supplemental Type Certificate, Issued To A Canadian Applicant" to Aero Design Ltd. A copy of the STC and required documents should accompany each installation. Also, your attention is directed to the limitations and conditions specified in the STC.

If you have any questions or require additional information, please contact Mr. Leung Lee by telephone at 1-516-228-7309 or by facsimile at 1-516-228-5531.

Sincerely,



Anthony Socias
Manager, New York Aircraft Certification Office

Enclosures

United States of America
Department of Transportation -- Federal Aviation Administration

Supplemental Type Certificate

IMPORT

Number SR02730NY

This certificate issued to Aero Design Ltd.
2013 -- 39th Avenue North East
Calgary, Alberta, T2E 6R7
Canada

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 7/29 of the Civil Air/Federal Aviation Regulations.

Original Product -- Type Certificate Number : *

Make : *

*See attached FAA Approved Model List (AML) No. SR02730NY for a list of approved models and applicable airworthiness regulations.

Model : *

Description of Type Design Change:

Configuration A -- Quick Release Mounting Provisions:

Installation of Quick Release Mounting Provisions on the right or left side in accordance with AERO Design Ltd. Installation Document 75102 Revision 0, as listed in Document Control List DCL751-1 Revision 1, dated September 15, 2008, TCCA approved September 30, 2008, or later TCCA approved revisions.

(See Continuation Sheet 2 of 2)

Limitations and Conditions:

1. Installation of Configuration A is a prerequisite for the installation of Configuration B.
2. Installation of Configuration A is a prerequisite for the installation of Configuration C.
3. Configuration A may remain installed on aircraft when Configuration B or C is removed.
4. Eligibility limitations of cargo basket modifications are noted on the drawings listed in AERO Design Ltd. Document Control List DCL704 Revision 3, dated July 31, 2008.

(See Continuation Sheet 2 of 2)

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application : March 19, 2009

Date reissued :

Date of issuance : September 11, 2009

Date amended :



By direction of the Administrator

[Signature]
(Signature)

Anthony Socias
Manager
New York Aircraft Certification Office

(Title)

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

United States of America
Department of Transportation -- Federal Aviation Administration
Supplemental Type Certificate
(Continuation Sheet)
Number SR02730NY

Description of Type Design Change: (Continued)

Configuration B – Quick Release Cargo Basket Installation:

Installation of Quick Release Cargo Basket on the right or left side in accordance with AERO Design Ltd. Installation Document 75101 Revision 1, as listed in Document Control List DCL751-1 Revision 1, dated September 15, 2008, TCCA approved September 30, 2008, or later TCCA approved revisions.

Configuration C – Quick Release Step Installation:

Installation of Quick Release Step on the right or left side in accordance with AERO Design Ltd. Installation Document 80001 Revision 0, as listed in Document Control List DCL800-1 Revision 0, dated September 15, 2008, TCCA approved September 30, 2008, or later TCCA approved revisions.

Cargo Basket Modifications:

Modifications to the cargo basket configuration are eligible in accordance with AERO Design Ltd. Document Control List DCL704 Revision 3, dated July 31, 2008, TCCA approved September 30, 2008, or later TCCA approved revisions.

Limitations and Conditions: (Continued)


5. AERO Design Ltd. Rotorcraft Flight Manual Supplement FMS751.91, Revision 1, dated July 16, 2008, TCCA approved September 30, 2008, or later TCCA approved revisions is required to all installation configurations.
6. AERO Design Ltd. Instructions for Continued Airworthiness ICA 751.90 Revision 1, dated November 18, 2008, TCCA accepted August 14, 2009, or later TCCA accepted revisions is required with the installation of the quick release cargo basket.
7. AERO Design Ltd. Instructions for Continued Airworthiness ICA 800.90 Revision 0, dated July 17, 2008, TCCA accepted September 30, 2008, or later TCCA accepted revisions is required with the installation of the quick release step.
8. The installer must determine whether this design change is compatible with previously approved modifications.
9. If the holder agrees to permit another person to use this certificate to alter a product, the holder must give the other person written evidence of that permission.

.....END.....

FAA APPROVED MODEL LIST (AML) NUMBER SR02730NY
AERO DESIGN LTD.
FOR
INSTALLATION OF QUICK RELEASE MOUNTING PROVISIONS/CARGO BASKET/STEP

Issue Date: September 11, 2009

ITEM	PART	REGULATION	AIRCRAFT MAKE	AIRCRAFT MODEL	ORIGINAL TYPE CERTIFICATE NUMBER	AML AMENDMENT DATE
1	7	Civil Air	Bell	205A-1	H1SW	
2	29	Federal Aviation	Bell	212 412 412EP 412CF	H4SW	

FAA Approved: 
Anthony Socias
Manager, New York Aircraft Certification Office

Steven Fahey

From: "Austen, David" <david.austen@tc.gc.ca>
To: "Steven Fahey" <steve@aerodesign.ca>
Sent: Wednesday, September 09, 2009 12:28 PM
Subject: RE: Status of STC applications @ FAA

Hi Steve:

Nothing yet, so I just gave them a gentle nudge....

Cheers!

David Austen, FEC, P.Eng.

Aircraft Certification | Certification des aeronefs

(780) 495-5226 | Facs/telec: (780) 495 7963

To provide feedback to TCCA, use CAIRS.

See: <http://www.tc.gc.ca/CivilAviation/ManagementServices/QA/cairs.htm>

Pour tout commentaire à TCAC, utiliser CAIRS.

Voir: <<http://www.tc.gc.ca/AviationCivile/ServicesdeGestion/AQ/ssqac.htm>>

From: Steven Fahey [mailto:steve@aerodesign.ca]

Sent: 09 September, 2009 2:28 PM

To: Austen, David

Subject: Re: Status of STC applications @ FAA

Hello Dave,

Have you heard back from them?

Steve

----- Original Message -----

From: Austen, David

To: Steven Fahey

Cc: Anthony.Troia@faa.gov ; raymond.reinhardt@faa.gov

Sent: Monday, August 24, 2009 8:22 AM

Subject: RE: Status of STC applications @ FAA

Thx for the note, Steven.

Anthony:

Can we enlist your assistance to let us know where the following applications stand?

I apologise for not having the FAA project number handy at this point.

Best regards,

David Austen, FEC, P.Eng.

Aircraft Certification | Certification des aeronefs

(780) 495-5226 | Facs/telec: (780) 495 7963

To provide feedback to TCCA, use CAIRS.

See: <http://www.tc.gc.ca/CivilAviation/ManagementServices/QA/cairs.htm>

Pour tout commentaire à TCAC, utiliser CAIRS.

Voir: <<http://www.tc.gc.ca/AviationCivile/ServicesdeGestion/AQ/ssqac.htm>>

From: Steven Fahey [mailto:steve@aerodesign.ca]
Sent: 21 August, 2009 12:00 PM
To: Austen, David
Subject: Status of STC applications @ FAA

Hi Dave,

I'd like to check in on any news from the FAA. We have several STC applications open:

Cargo baskets for the
Bell 212/205 SH07-56
Bell 206B SH09-5
Bell 407/206L SH00-48 (SR02253NY)
MD600N SH09-1

Destiny/Kodiak SH02-17 (SR01655NY)

Thanks,

Steven Fahey
steve@aerodesign.ca
Aero Design Ltd.
2013 - 39th Avenue NE
Calgary, Alberta, Canada
T2E 6R7
tel: (403) 250-8027
fax: (403) 250-8333
www.aerodesign.ca



Transport
Canada

Transports
Canada

1100-9700 Jasper Avenue
Edmonton, Alberta T5J 4E6

Your file Votre référence

May 6, 2009

Our file Notre référence

C-09-0443
SH00-48

Department of Transportation
Federal Aviation Administration
New York Aircraft Certification Office ANE-170
1600 Stewart Avenue, Suite 410, Westbury, NY 11590

Attention: Anthony Socias, Manager

**SUBJECT: Application for Reissue of FAA Supplemental Type Certificate SR02253NY
Cargo Basket Installation**

We have received an application from Canadian applicant, Aero Design Ltd., for the reissue of a Canadian Supplemental Type Certificate (STC) and existing FAA STC for Installation of Cargo Basket / External Attachment Provisions/Optional Step on Bell 206L, 206L-1, 206L-3, 206L-4, 407 Rotorcraft.

We have reviewed the applicant's submission and certify that the design change complies with the basis of certification specified in Canadian Type Certificate H-92. We have therefore issued STC SH00-48, Issue 7, dated April 7, 2009. We also confirm that compliance is demonstrated with FAA Type Certificate H2SW, unless additional technical conditions are applied by the FAA.

Please consider this to be a formal application for the re-issue of FAA STC SR02253NY under the provision of the Canada/U.S. Bilateral Airworthiness Agreement. In support of this application, a document package is enclosed, as detailed in the attached letter from Aero Design Ltd., dated April 29, 2009.

Yours truly,

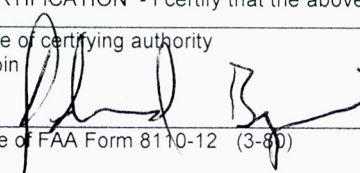
J. Staal
Aircraft Certification Engineering Technologist
Prairie and Northern Region
Phone: 780-495-5227
Facs: 780-495-7963

enclosure(s)

cc: Aero Design Ltd.

Canada

No certificate may be issued unless a completed application form has been received.

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION		FORM APPROVED O.M.B. No. 04-R0078
APPLICATION FOR TYPE CERTIFICATE, PRODUCTION CERTIFICATE, OR SUPPLEMENTAL TYPE CERTIFICATE		
1. Name and address of applicant AERO Design Ltd. 2013 - 39 th Avenue NE Calgary, Alberta, Canada T2E 6R7	2. Application made for: <input type="checkbox"/> Type Certificate <input type="checkbox"/> Production Certificate <input checked="" type="checkbox"/> Supplemental Type Certificate	3. Product involved: <input checked="" type="checkbox"/> Aircraft <input type="checkbox"/> Engine <input type="checkbox"/> Propeller
4. TYPE CERTIFICATE (Complete item 4a below)		
a. Model designation(s) (All models listed are to be completely described in the required technical data, including drawings representing the design, material specifications, construction and performance of the aircraft, aircraft engine propeller which is the subject of this application.		
5. PRODUCTION CERTIFICATE (Complete items 5a - c below. Submit with this form in manual form one copy of quality control data or changes thereto covering new products as required by applicable FAR)		
a. Factory address (If different from above)	b. Application if for: <input type="checkbox"/> New Production Certificate <input type="checkbox"/> Additions to Production Certificate (Give P.C. No.)	P.C. No.
c. Applicant is holder of license under a Type Certificate or a Supplemental Type Certificate (Attach evidence of licensing agreement and give certificate number)		T.C. / S.T.C. No.
6. SUPPLEMENTAL TYPE CERTIFICATE (complete items 6a - d below)		
a. Make and model designation of product to be modified Bell Helicopter (Textron) Models 205A-1, 205B (H1SW), 212, 412, 412EP, 412CF (H4SW)		
b. Description of modification Installation of External Cargo Basket Aluminum support beams attach to the hardpoints under the cabin. Steel frame basket lined with mesh attaches to the support beams to carry cargo externally. The basket can be mounted and removed from the beams without tools.		
c. Will data be available for sale or release to other persons? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		d. Will parts be manufactured for sale? (Ref: FAR 21.303) <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
7. CERTIFICATION - I certify that the above statements are true.		
Signature of certifying authority E. Burgoin Per: 	Title P.Eng, DAR 290M (AERO Design Ltd.)	Date 19 March, 2009

[RGL Home](#)

Code of Federal Regulations

This Section of CFR is No Longer Current.
Click "Here" to go to CFR database and search for current section.

▼ Sec. 21.25

Part 21 CERTIFICATION PROCEDURES FOR PRODUCTS AND PARTS
Subpart B--Type Certificates

Sec. 21.25

Issue of type certificate: restricted category aircraft.

(a) An applicant is entitled to a type certificate for an aircraft in the restricted category for special purpose operations if he shows that no feature or characteristic of the aircraft makes it unsafe when it is operated under the limitations prescribed for its intended use, and that the aircraft--

- (1) Meets the airworthiness requirements of an aircraft category except those requirements that the Administrator finds inappropriate for the special purpose for which the aircraft is to be used; or
- (2) Is of a type that has been manufactured in accordance with the requirements of and accepted for use by, an Armed Force of the United States and has been later modified for a special purpose.

(b) For the purposes of this section, "special purpose operations" includes--

- (1) Agricultural (spraying, dusting, and seeding, and livestock and predatory animal control);
- (2) Forest and wildlife conservation;
- (3) Aerial surveying (photography, mapping, and oil and mineral exploration);
- (4) Patrolling (pipelines, power lines, and canals);
- (5) Weather control (cloud seeding);
- (6) Aerial advertising (skywriting, banner towing, airborne signs and public address systems); and
- (7) Any other operation specified by the Administrator.

► Comments

▼ Document History

Notice of Proposed Rulemaking Actions:

Proposed Recodification; Notice No. 61-25; Issued 11/8/61.

Notice of proposed rulemaking; Notice No. 64-7; Issued 2/5/64.

Notice of proposed rulemaking; Notice No. 64-31; Issued 5/20/64.

Final Rule Actions:

Final Rule. Docket Nos. 3096, 5085; Issued on 10/14/64.

FAA.gov Home | **Privacy Policy** | **Web Policies & Notices** | **Contact Us** | **Help**

Readers & Viewers: PDF Reader | MS Word Viewer | MS PowerPoint Viewer | MS Excel Viewer | Zip

Steven Fahey

From: "Steven Fahey" <steve@aerodesign.ca>
To: "Jack Staal" <jack.staal@tc.gc.ca>
Cc: "Ted Burgoin" <ted@aerodesign.ca>
Sent: Friday, March 13, 2009 1:42 PM
Attach: FAA_Application_8110-12.pdf
Subject: Re: FAA Validation of TCCA STC SH07-56, FAA Project ST6251NY-R

Jack,

The missing "412CF" is just finger problems on my part. To submit a correct application form, I have made an update and it is attached to this e-mail.

The UH-1's are approved only in the USA, of course, under a myriad of TCDS's. Generally they all have the "FAR 21.25" Restricted category/Ex-military basis of certification. Some have specific statements about "modifications" that are important to us. An example of this is TCDS R00002RC, which requires subsequent modifications to meet FAR 29 standards at amendment 1, and include ICA's. These requirements have been met with the data provided. Others specify modifications are to meet CAR 7, so of course those have been met, too.

Perhaps a more appropriate question to ask the FAA is how they prefer to handle such modifications on the UH-1's. They may not require a STC for the installation, or have some other means of showing airworthiness on these aircraft. The text in the TCDS tells me that the STC is necessary, so we assumed that equivalence to the civilian TCDS basis of certification would be enough. Approval of Canadian STC's on UH-1's has been done in the past but there is no guidance that I know of on the subject.

For reference, we have found the following TCDS for UH-1B / H models:

H1RM
H3NM
H3SO
H5SO
H6SO
H7SO
H13WE
H15NM
R00002RC
R00005SE
R00007DE
R00012AT

There could of course be more, but we missed in our search. I have omitted the UH-1F and other models because I am told they are much less common.

If this info is enough to go on, please forward it to the FAA and let me know if it is satisfactory to them. If not, I can provide more help as needed. Call or reply with any more questions.

Steven Fahey
steve@aerodesign.ca
Aero Design Ltd.
2013 - 39th Avenue NE
Calgary, Alberta, Canada
T2E 6R7
tel: (403) 250-8027
fax: (403) 250-8333
www.aerodesign.ca

----- Original Message -----

From: "Ted Burgoin" <ted@aerodesign.ca>
To: <steve@aerodesign.ca>; "jeff" <jeff@aerodesign.ca>
Sent: Thursday, March 12, 2009 12:35 PM
Subject: Fw: FAA Validation of TCCA STC SH07-56, FAA Project ST6251NY-R

>

> ----- Original Message -----

> From: "Staal, Jack" <jack.staal@tc.gc.ca>
> To: <ted@aerodesign.ca>
> Sent: Monday, March 09, 2009 2:46 PM
> Subject: FW: FAA Validation of TCCA STC SH07-56, FAA Project ST6251NY-R

>

>

> Hi Ted,

>

> Attached comments from the FAA. I need to pull the file and review.

>

> I expected the UH-1 comments as we didn't address the UH-1 on our STC.

> The FAA want the specific FAA TCDS for the UH-1 and it's certification
> basis reviewed.

>

> Regarding the 412HP I guess we will have to drop that from the FAA
> application if it is not on the FAA TCDS. I will check or have you
> checked?

>

> I will review the comments further. In the meantime do you want the UH-1
> to remain??

>

> Thanks,

> J.H. (Jack) Staal

> Aircraft Certification Technologist | Technologue, Certification des
> aeronefs.

> Prairie and Northern Region | Region des Prairies et du Nord

>

> Telephone | telephone: (780)495-5227

> Facsimilie | telecopier: (780)495-7963

> Email | courriel: jack.staal@tc.gc.ca

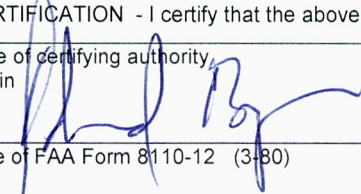
> TTY / ATS : 1-888-675-6863

> From: Leung.Lee@faa.gov [mailto:Leung.Lee@faa.gov] Sent: Wednesday, March
> 04, 2009 3:57 PM
> To: Staal, Jack
> Cc: Ray.Reinhardt@faa.gov
> Subject: Re: FAA Validation of TCCA STC SH07-56, FAA Project ST6251NY-R

> This is in reference to your STC validation request for TCCA STC No.
> SH07-56 Issue 2,
> FAA project no. ST6251NY-R:

> Leung Lee
> NYACO

No certificate may be issued unless a completed application form has been received.

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION		FORM APPROVED O.M.B. No. 04-R0078
APPLICATION FOR TYPE CERTIFICATE, PRODUCTION CERTIFICATE, OR SUPPLEMENTAL TYPE CERTIFICATE		
1. Name and address of applicant AERO Design Ltd. 2013 - 39 th Avenue NE Calgary, Alberta, Canada T2E 6R7	2. Application made for: <input type="checkbox"/> Type Certificate <input type="checkbox"/> Production Certificate <input checked="" type="checkbox"/> Supplemental Type Certificate	3. Product involved: <input checked="" type="checkbox"/> Aircraft <input type="checkbox"/> Engine <input type="checkbox"/> Propeller
4. TYPE CERTIFICATE (Complete item 4a below)		
a. Model designation(s) (All models listed are to be completely described in the required technical data, including drawings representing the design, material specifications, construction and performance of the aircraft, aircraft engine propeller which is the subject of this application.		
5. PRODUCTION CERTIFICATE (Complete items 5a - c below. Submit with this form in manual form one copy of quality control data or changes thereto covering new products as required by applicable FAR)		
a. Factory address (If different from above)	b. Application if for: <input type="checkbox"/> New Production Certificate <input type="checkbox"/> Additions to Production Certificate (Give P.C. No.)	P.C. No.
c. Applicant is holder of license under a Type Certificate or a Supplemental Type Certificate (Attach evidence of licensing agreement and give certificate number)		T.C. / S.T.C. No.
6. SUPPLEMENTAL TYPE CERTIFICATE (complete items 6a - d below)		
a. Make and model designation of product to be modified Bell Helicopter (Textron) Model 205A-1, 205B, 212, 412, 412EP, 412CF, UH-1B, UH-1H		
b. Description of modification Installation of External Cargo Basket Aluminum support beams attach to the hardpoints under the cabin. The basket can be mounted and removed from the beams without tools.		
c. Will data be available for sale or release to other persons? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		d. Will parts be manufactured for sale? (Ref: FAR 21.303) <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
7. CERTIFICATION - I certify that the above statements are true.		
Signature of certifying authority E. Burgoin Per: 	Title P.Eng, DAR 290M (AERO Design Ltd.)	Date 13 March, 2009

Duplicate of FAA Form 8110-12 (3-80)

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

R00002RC
Initial Issue
Global Helicopter
Technology, Inc.
U.S. Army UH-1H
September 20, 2001

TYPE CERTIFICATE DATA SHEET NO. R00002RC

This data sheet, which is part of Type Certificate No. R00002RC, prescribes conditions and limitations under which the product for which the type certificate was issued, meets the airworthiness requirements of the Federal Aviation Regulations.

Type Certificate Holder: Global Helicopter Technology, Inc.
5070 South Collins, Suite 206
Arlington, Texas 76018

1- Model UH-1H, (Utility Helicopter, Restricted Category), Approved: September 20, 2001
(See note 16 regarding aircraft, engines and appliances and note 18 regarding definition of type design configuration)

Engine: Lycoming T53-L-13B (See note 15 for alternate engines)

Fuel: MIL-T-5624, Grade JP-5 (Jet A)
(See note 13 for alternate and emergency fuels)

Engine Limits: T53-L-13B: (See note 15 for alternate engines)

	Torque Press (PSI)	Output Horsepower (HP)	Output RPM	Exhaust Gas Temp (C degrees)	Gas generator Speed N1 (%)
Maximum Cont.	50.0	1100	6600	610	101.5
Take-Off (30 minutes)	50.0	1100	6600	610 to 625	101.5
Start and Accel (10 sec)	50.0	1100	6600	625-675	101.5
Start and Accel (5 sec)	50.0	1100	6600	675-760	101.5
Maximum	50.0	1100	6600	760	101.5

See notes 11 & 12. Refer to Operation's Manual TM55-1520-210-10 for additional limitation data.

Rotor Speed Limits:

	<u>Power Off</u>	<u>Power On</u>
Maximum rpm	339	324
Minimum rpm	294	294

Continuous operation: 294-324 RPM / Maximum for auto-rotation is 339 RPM

Transmission
Torque Limits: Fifty (50.0) calibrated PSIG (See note 11)

Page No.	1	2	3	4	5	6	7
Rev. No.	-	-	-	-	-	-	-

Airspeed Limits:Roof-Mounted pitot static:

Never exceed 124 knots (143 mph) up to 7500 lbs. Gross Weight, sea level to 2000 feet. Never exceed 113 knots (132 mph) up to 9500 lbs. Gross Weight, sea level to 2000 feet. **See Note 2** and refer to TM55-1520-210-10, Chapter 5, Section X, for specific operating airspeed limitations.

Nose mounted pitot static:

Never exceed 112 knots (128 mph) up to 7500 lbs. Gross Weight, sea level to 2000 feet. Never exceed 103 knots (118 mph) up to 9500 lbs. Gross weight, sea level to 2000 feet. **See Note 2** and refer to TM55-1520-210-10, Chapter 5, Section X, for specific operating airspeed limitations.

**Center of Gravity
(CG) Range:**

Longitudinal CG Limits (+130.0) to (+144.0)

Lateral CG Limits: Plus or minus 5 inches

Refer to U. S. Army TM55-1520-210-10, Chapter 6, Section VII, for specific CG ranges and limits.

Datum:

Station 0, datum is 7.6 inches, aft of the most forward point of the fuselage nose section (See U.S. Army TM55-1520-210-10, chapter 6).

Leveling Means:

Plumb line from top of cabin doorframe to index plate on cabin floor.

See Note 1.

**Empty Weight
(CG) Range:**

Refer to specific Aircraft Maintenance log for empty weight CG determined as prescribed per U.S. Army Aviation Maintenance Engineering Manual Weight and Balance TM55-1500-342-23.

Maximum Weight:

9500 lbs.

Minimum Crew:

1 (Pilot)

No. of Seats:

Crew only as required to perform restricted category mission in accordance with FAR 133.1(b), with appropriate seats and restraints (See U.S. Army TM-55-1520-210-10). Passengers cannot be transported during restricted category flight operations (see FAR 91.313)

Maximum Baggage:

100 lbs. Per sq. Ft. on cabin floor as required to perform restricted category mission in accordance with FAR 133.1(b). (See U.S. Army TM55-1520-210-10)

Fuel Capacity:

Crashworthy system: 208.5 U.S. gals. (+151.6) Unusable-2 U.S. gals.

Non-Crashworthy system: 220 U. S. gals. (+151.6) Unusable 2 U.S. gals.

Oil Capacity:

Engine: 3.25 gals. (+173.0)

Transmission: 11.0 U.S. quarts

Hydraulic: 10.0 U.S. pints

**Maximum Operation
Altitude:**

Refer to U.S. Army TM-55-1520-210-10 Chapter 7, Performance Data Charts

**Rotor Blade and
Control Movement:**

For rigging information, refer to U.S. Army TM55-1520-210-23 Chapter 11 (Maintenance Manual):

Eligible Serial No.: Global Helicopter Technology, Inc. FAA approved Serial Number Eligibility List Report number GHT-01-412-SN dated July 23, 2001 or later FAA approved revision

Certification Basis: FAR 21.25(a)(2), effective February 1, 1965, for the special purpose of External Load Operations under FAR 21.25(b)(7) (**See note 17**). Repetitive high torque cycle events beyond the following are not approved:

- (a) Two (2) Ground-Air-Ground (GAG) Cycles per Flight hour from rotors stopped to Flight Conditions to rotors stopped.
- (b) four (4) GAG Cycles per flight hour from rotors turning at ground idle (at 0% rpm) to flight conditions to rotors turning at ground idle (at 100% rpm).

GAG cycles in (a) and (b) above shall be applied independently

In accordance with FAR 36.1(a)(4), compliance with the noise requirements was not shown. Therefore, aircraft certificated under this type certificate are only eligible for external load operations excepted by FAR 36.1(a)(4) and defined under FAR 133.1(b). Any alteration to the aircraft for Special Purposes not identified above require further FAA approval and in addition, may require noise and / or flight testing.

The aircraft certified under this type certification is accepted under the concept of limited exposure associated with escape from inadvertent ice encounters and is prohibited against flight into known icing. This Aircraft must be reevaluated if certification to the General Ice Protection Airworthiness Regulations is requested.

Any Subsequent modifications are to meet FAR 29 Airworthiness standards, transport category Rotorcraft, as of Amendment Number 1, effective August 12, 1965 and FAR 29.1529, instructions for Continued Airworthiness, Amendment number 20, effective September 11, 1980.

Date of Application: November 29, 2000

Production Basis: None. No helicopters may be produced under this approval. (**See Note 4**)

Equipment: The basic required equipment as prescribed in the applicable airworthiness regulations (see Certification Basis) must be in each helicopter for certification. The following equipment and documents must be available in each helicopter for certification:

- (a) U.S. Army TM55-1520-210-10, Operator's Manual, UH-1H.
- (b) Standard U. S. Army cargo suspension system installation, part numbers 204-070-900-5, 204-070-900-19, IAW TM55-1520-210-23P (Parts Manual), installed and maintained IAW TM55-1520-210-23 (Maintenance Manual), and operated IAW TM55-1520-210-10 (Operators Manual) for all external cargo operations.

Notes

- Note 1:** A current weight and balance report including a list of equipment included in the certificated empty weight, and loading instructions, when necessary, must be provided for each aircraft at the time of original certification. Refer to Operation's Manual, TM55-1520-210-10, Chapter 6, and Maintenance Manual, TM55-1520-210-23-1 Para. 1-38, for leveling means and weight and balance determination.
- Note 2:** The following placards must be prominently displayed in the cabin in clear view of the pilot:

Placard No. 1

"THIS HELICOPTER MUST BE OPERATED IN ACCORDANCE WITH THE RESTRICTED CATEGORY OPERATING LIMITATIONS OF FAR 91.313."

Placard No. 2

"THIS HELICOPTER MUST BE OPERATED IN COMPLIANCE WITH THE OPERATING LIMITATIONS SPECIFIED IN THE APPROVED HELICOPTER OPERATION'S MANUAL. REFER TO TM55-1520-210-10, CHAPTER 5 OPERATING LIMITS AND RESTRICTIONS."

Placard No. 3

CALIBRATED AIRSPEED-KNOTS
With Roof-mounted pitot static

LIMITS: ACFT WT/KIAS

GROSS WEIGHT

DENSITY			
<u>ALT(FT)</u>	<u>To 7500(lbs)</u>	<u>8500(lbs)</u>	<u>9500(lbs)</u>
SL TO 2000	124	118	113
3000	121	115	110
6000	112	106	101
9000	103	97	92
12000	94	88	83
15000	82	---	---
18000	70	---	---

-
- - UNDER 7500 LBS USE 6000 TO 6600 RPM RANGE
 - OVER 7500 LBS GW USE 6400 TO 6600 RPM RANGE
 - POWER OFF 294 TO 339 ROTOR RPM
 - REDUCE SPEED WHEN VIBRATION IS EXCESSIVE

CALIBRATED AIRSPEED-KNOTS
With Nose-mounted pitot static

LIMITS: ACFT WT/KIAS

GROSS WEIGHT

DENSITY ALT(FT)	To 7500(lbs)	8500(lbs)	9500(lbs)
SL TO 2000	112	107	103
3000	109	104	100
6000	100	95	91
9000	91	86	82
12000	82	77	73
15000	70	65	---
18000	58	---	---

-
- **UNDER 7500 LBS USE 6000 TO 6600 RPM RANGE**
- **OVER 7500 LBS GW USE 6400 TO 6600 RPM RANGE**
- **POWER OFF 294 TO 339 ROTOR RPM**
- **REDUCE SPEED WHEN VIBRATION IS EXCESSIVE**

Placard No. 4

“EXTERNAL LOAD OPERATIONS: Vne WILL BE DETERMINED FOR EACH PROPOSED EXTERNAL LOAD APPLICATION.”

Note 3: The helicopter(s) must be serviced, maintained, inspected and overhauled in accordance with the documents specified in Instructions for Continued Airworthiness Report GHT-01-412-201, dated July 23, 2001 (or later FAA accepted revision) or other FAA accepted inspection programs. The TC holders instructions for Continued Airworthiness Report is part of the TC holders Instructions for Continued Airworthiness.

Note 4: Prior to obtaining an original Airworthiness Certificate:

- (a) Each helicopter must pass a conformity inspection in accordance with Global Helicopter Technology, Inc. Configuration Report (Report Number) dated (Report Date). The Configuration Report must contain a complete description of each helicopter, any Military Maintenance Work Orders accomplished on that particular helicopter. In addition, each helicopter must pass an inspection for any possible hidden damage and the military records reviewed for acceptability for any repairs or alterations.
- (b) The maintenance, overhaul, and modification records of each helicopter must be reviewed for military changes that may effect the airworthiness of the helicopter.
- (c) After the required inspections, the aircraft must be found to be in a good state of preservation, adequate repair, and in a condition for safe operation.

- Note 5:** This aircraft is prohibited from carrying cargo for compensation or hire. Carriage of cargo is limited to such cargo that is incidental to the aircraft owners/operator's business which is other than air transportation.
- Note 6:** Restricted category aircraft may not be operated in a foreign country without the express written approval of the country.
- Note 7:** This aircraft has not been shown to meet the requirements of the applicable comprehensive and detailed Airworthiness Code as provided by Annex 8, to the Convention on International Civil Aviation.
- Note 8:** Engine changes are allowed provided the replacement engine is of the same make and model as identified in this TCDS. The replacement engine must have proper military records and have the applicable FAA Airworthiness inspections and Airworthiness Directives (AD) accomplished.
- Note 9:** The Airworthiness Directives for the helicopter and engine contained in GHT-01-412-202, Airworthiness Directive Report, dated February 6, 2001, (or later FAA approved revision), must be complied with prior to original certification.
- Note 10:** The cargo suspension assembly (cargo external load hook and release system) shall be installed, tested and maintained in accordance with TM 55-1520-210-23-2, Chapter 14, paragraph 14-260.
- Note 11:** Torque pressure output by the engine torque sensing system varies with individual engines. A calibration of this value is required on each engine and the value corresponding to take-off power is stamped on the engine data plate.
- Note 12:** Maximum permissible exhaust gas temperature varies with ambient temperature as described in the Operator's Manual. Check engine EGT by use of Health Indicator Test (HIT) prior to takeoff (see U.S. Army TM55-1520-210-10 and HIT EGT Log for the aircraft).
- Note 13:** Alternate and emergency fuels are listed in U.S. Army TM55-1520-210-10, Chapter 2, Paragraph 2-89 and Table 2-1. Some limitations apply for the use of certain alternate and emergency fuels. These limitations are listed in the above U.S. Army TM paragraph.
- Note 14:** Bell Helicopter Textron, Inc. is not involved with this Type Certificate. Global Helicopter Technology, Inc. is the original holder of this TC Number.
- Note 15:** Alternate engines:

Lycoming T53-L-13BA

Alternate engines must be installed and operated in accordance with U.S. Army TM55-1520-210-10 Operator's Manual.
- Note 16:** Aircraft, aircraft engines and appliances that cannot provide documentation with satisfactory service history showing they were surplus from an Armed Force of the United States are not eligible under this type certificate.

Note 17:

For External Load Operations under FAR 21.25 (b)(7), the rotorcraft must have external cargo hook assembly P/N 204-072-024-1 installed on model UH-1H as part of the military configuration. Continued airworthiness of the cargo hook and release installation shall be in accordance with TM55-1520-210-23-2, Chapter 14, Paragraph 14-260.

Note 18:

This type certificated design is the US Army configuration at the time of the issuance of this type certificate as defined by the US Army documents listed in the Instructions for Continued Airworthiness (ICA) Report GHT-01-412-201, dated July 23, 2001 (or later FAA accepted revision). All U.S. Army manuals listed in this type certificate data sheet are defined as of those revisions and dates listed in the above FAA accepted ICA.

.....END.....

JEFF LODGE

1-850-228-7769

UH-1H

= 205A-1

MOST COMMON
SAME HARD POINTS

A FEW UH-1B

NOT MANY UH-1F

← SIC GLOBAL EAGLE
PT6

Cargo Expansion

Heli-Utility-Basket™



Constructed of stainless steel with a high-gloss, white scratch-resistant finish, DART baskets are practical and they look great.

A self-locking handle keeps cargo secure during flight. The easy bolt-on installation allows you to install or remove the basket in minutes wherever you are.

- Stainless steel construction
- Self-locking handle
- Easy installation
- Ideal for transportation of skis, golf clubs, fire fighting equipment or tools

PRODUCT SPECIFICATIONS

Part Number	D205-541-043(LH) D205-541-044(RH)
Aircraft	205/210/212/214/412/UH-1
Length	96" / 2.55m
Width	26" / 0.66m
Depth	26" / 0.66m
Load Capacity	300 lb / 136 kg or 220 lb / 100 kg
Weight	118 lb / 54.00 kg

HELI-UTILITY-BASKET™

Approval	STC Number	A/C Approved	STC Description	
Canada	SH96-120	205A/205A-1/205B/212/214/214B1/412/412CF/412EP	Heli-Utility-Basket™	
USA	SR00696NY	205A/205A-1/205B/210/212/214/214B1/412/412CF/412EP/AB412/AB412EP	Heli-Utility-Basket™	
EASA	EASA.IM.R.S.01242	205A/205A-1/205B/212/214B/214B1/412/412EP	Heli-Utility-Basket™	
New approvals are continually being added; if you do not see your required approval, contact your DART sales office to verify the status.				
Part Number	Product Description		Kit Weight	Installation Time
D205-541-044	Heli-Utility-Basket™ – RH		118.00 lb / 53.60 kg	2 hrs
D205-541-043	Heli-Utility-Basket™ – LH		118.00 lb / 53.60 kg	2 hrs
DSI9226-011	Basket Conversion Kit		3.00 lb / 1.36 kg	8 hrs
DSI9268-011	Basket Modification Kit		20.00 / 9.00 kg	4 hrs
Part Number	Product Description	Special Comments	Aircraft Model	Price (USD)
D205-541-044	Heli-Utility-Basket™ – RH	300 lb / 136 kg load capacity. Mounts to existing hardpoints at STA 84.29/129.00/155.06. Conversion kit available for additional basket volume	205/210/212/214/412/UH-1	\$8,998
D205-541-043	Heli-Utility-Basket™ – LH	300 lb / 136 kg load capacity. Mounts to existing hardpoints at STA 84.29/129.00/155.06. Conversion kit available for additional basket volume. Available by special order only	205/210/212/214/412/UH-1	\$8,998
DSI9226-011	Basket Conversion Kit	Upgrades D205-541-041/-042 basket from 220 lb / 100 kg load capacity to the D205-541-043/-044 300 lb / 136 kg capacity	205/210/212/214/412/UH-1	\$880
DSI9268-011	Basket Modification Kit	Increases basket volume. D205-541-041/-042 baskets must be previously upgraded to -043/-044	205/210/212/214/412/UH-1	\$1,419

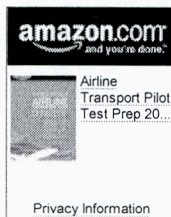
helis.com

helicopter history site

[Login](#) | [Contact us](#)

[Home](#)
[How they flies](#)
[Database](#)
[Using helicopters](#)
[Pioneers](#)
[Manufacturers](#)
[Stories](#)
[Videos](#)
[Sounds](#)
[Operations](#)
 [Katrina](#)
 [Eagle Claw](#)
[Featured](#)
 [Ultralights](#)
 [Tiltrotors](#)
 [Gunships](#)
 [Cockpits](#)
 [US Coast Guard](#)
[Spotters](#)
[Books](#)
[Magazines](#)
[Games](#)
[News Archives](#)

You need to login
to edit this page



Bell Helicopter?

Looking for Bell Helicopter? Find it here. Great Resources & Info

[mysmartbargains.com](#)

Huey Helicopter Pictures

We know everything about air craft Find huey helicopter pictures online.

[AirplanesUSA.com](#)

Bell Helicopter?

Looking For Bell Helicopter? Find it Here. More Resources & Info.

[cproducts.com](#)

Helicopter Aerodynamics

Search Thousands of Catalogs for Helicopter Aerodynamics

[www.globalspec.com](#)

SEARCH THE 6000+ UNIVERSITIES THAT ACCEPT TOEFL

TOEFL Go anywhere from here.

[REGISTER](#)

Bell 204 / 205

H-1 Iroquois Huey



Ads by Google

The Bell Huey was the first mass-produced helicopter powered by a jet turbine. With its distinctive "whomp-whomp" sound that could be

heard miles away, the UH/AH-1 aircraft have totaled more than 27 million flight hours since Oct. 20, 1956 when the "granddaddy" of all H-1's, the XH-40, made its first flight. Since then, more than 16,000 H-1 helicopters have been produced by Bell and its licensees -- making it the most successful military aircraft in aviation history.

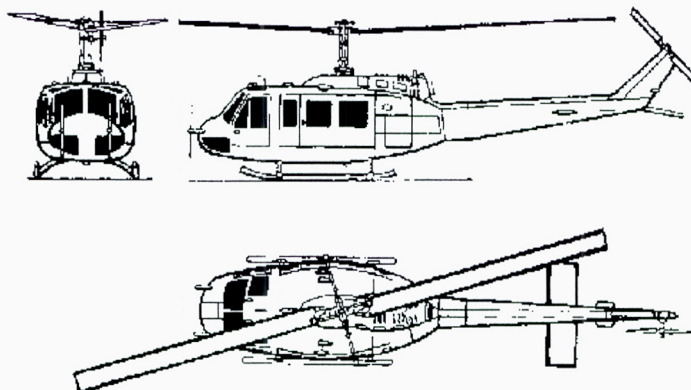
Officially the UH-1 series is the **Iroquois**. But its unofficial name, Huey, became so commonly used that the AH-1 attack version was officially named the Huey Cobra.

The Huey story traces back some four decades. In 1955, with an interest in a utility helicopter designed around a turboshaft engine, the US Army had the US Air Force develop a new helicopter for its use. At that time the US Army did not have its own aircraft development capability. The design selected, **Bell's Model 204**, was to be powered by a new Lycoming T-53 engine of some 850 shaft horsepower and featured a typical Bell two-blade teetering rotor.

In the original helicopter designation series, the first three aircraft received the **XH-40** designation. First flight of the new design was in October 1956, development and production following.

When the US Army adopted its own two-letter designation system, the H-40 became the HU-1 (Helicopter Utility). From this designation came Huey, the name by which it has remained known. The US Department of Defence (DOD) standard designation system reversed this to UH-1, the first designation in the new DOD helicopter series. With larger engines and increased capacity, the UH-1 was developed through successive models.

These helicopters are widely used in a transport, airborne battlefield command and control, troop insertion/extraction, fire support coordination, medical evacuation, search and rescue, armed escort/visual reconnaissance or utility roles.



Ads by Google

Bell Helicopter?

Looking For Bell Helicopter? Find it Here. More Resources & Info.

[cproducts.com](#)

Helicopter Shirts / Caps

New "Helicopters Save Lives" Shirt + Classic Aviation Caps

[heli-wear.com](#)

Agusta AW139

Executive

BRAND NEW, Fly Home Today Exclusive Pininfarina Edition

[AeroToyStore.com](#)

Blackhawk Helicopter

Need Blackhawk Helicopter? Check Our Great Resources. Dont Miss

[www.goodwilltoo.com](#)

Helicopter Training

Finding Helicopter Training Solutions Is Easy. Start Here!

[domylot.net/HelicopterTraining](#)

Thanks [vidassassin](#)



Bell model 204

The typical Bell main rotor design uses a notable feature in the form of two wide chord blades and, at right angles to them, the stabilizing bar with small weights at its tips (See *Arthur Young in the Pioneers* section)

XH-40 : (later redesigned **XHU-1**) The Bell Model 204 first flown in October 1956 with one 700 hp turbine engine. The 3 prototypes built were the first turbine engine aircraft of the US Army. (serial number 55-4459)

YH-40 : (later redesigned **YHU-1**) 6 test units with a fuselage 30 cm (1 feet) longer

HU-1 : (with the normalization of 1962 became the **UH-1 Iroquois**) 9 pre-productions units with one 770 hp T53-L-1A tested during 1959

HU-1A : (later **UH-1A**) 173 units produced up to March 1961. A crew of 2 plus 5 troops.

TH-1A : 14 UH-1A converted to dual control trainers

UH-1B : 1014 units built between 1961 and 1965 with a 960 hp T53-L-5 engine. 7 troops

UH-1C : 750 units with the same fuselage of the UH-1B but a larger engine (L11) and a newer rotor system that give them much greater manoeuvrability

UH-1E : 192 units built between 1964 and 1966. Was the UH-1B/C for the US Marines for assault support with salt-water corrosion protection and extra avionics. 8 troops.

TH-1E : 20 trainers of the UH-1E variant

UH-1F : (also called **UH-48** as missile site support helo) The UH-1B variant for the USAF with a 1300 hp T58-GE-3 turbine engine. 119 units built from 1964 to 1967. 10 troops

The UH-1F had a General Electric engine rather than the Lycoming engine used on other models at the time. It was more powerful than the Lycoming engines until the Lycoming TH-53-L13 engine was introduced in mid 1967. **TH-1F :** 26 UH-1F trainers

HH-1K : The UH-1E for the US Navy for SAR duties with a 1400 hp engine. 27 units in 1970

UH-1L : The UH-1E for the US Navy for multi-purpose duties with a 1100 hp engine. 10 units in 1968

TH-1L : 90 trainers for the US Navy

UH-1M : 3 UH-1C updated with a 1100 hp engine and 6 french AS.11 anti tank missiles for evaluation. They had a different rotor system and the tailboom had a sweeping vertical fin.

UH-1P : 20 UH-1F updated for psychological warfare

AB.204 : Model 204 built by Agusta in Italy

Fuji 204B-2 : Model 204 built in Japan

Bell model 205

YUH-1D : 7 prototypes ordered in July 1960 with a larger main rotor and a bigger fuselage for a 12 / 14 troops capacity

UH-1D : 2000 units with a 1100 hp turbine engine. First unit enter service in August 1963

UH-1H : The most important variant of the Huey was an updated version of the UH-1D with a 1400 hp T53-L-13 engine. 4900 units built for the US Army and 50 countries

EH-1H : UH-1Hs modified for electronic warfare in variations EH-1H Phase A and B and the **UH-1X** Model. Were replaced with the Sikorsky EH-60A

HH-1H : 30 UH-1Hs for the USAF for combat / SAR duties

The modification included moving the tail rotor to the right hand side of the tailboom. This modification was picked up by the US army and later UH-1H type aircraft were configured with the tail rotor on the left side. **UH-1V :** 200 UH-1Hs modified for medevac duties in the 80s

AB.205 : Model 205 built by Agusta in Italy
Fuji 205 : Model 205 built in Japan

Bell model 212

UH-1N : After the successful of the Models 204 / 205, Bell joined Pratt & Whitney Canada for develop a twin engine derivate of the UH-1H to achieve a specification came from the Canadian Armed Forces. The result was the **Model 212 Twin Two Twelve** adopted by the USAF (79 units) and the US Navy / Marines (221 units)

VH-1N : 8 units **Marine One** for the US president.

UH-1Y : Remanufactured UH-1N

AB.212 : Model 212 built by Agusta in Italy, including the **AB.212 ASW** naval helicopter

Contribution: *US Naval Historical Center and Bell Helicopters*

Related News:

- » [U.S. delivers anti-drug helicopters Sep 1, 1999](#)
- » [Mexico returns helicopters to U.S. Oct 5, 1999](#)
- » [US Navy UH-1N upgrade completed Jan 16, 2001](#)
- » [UH-1Y Utility Helicopter First Flight Dec 21, 2001](#)
- » [US key programs in troubles Mar 11, 2002](#)
- » [H-1 Flight Test Update Mar 29, 2002](#)
- » [Bell H-1 Program Update Jul 22, 2002](#)
- » [All 5 upgrade H-1 test aircraft flying Oct 08, 2002](#)
- » [Bell 210 Completes First Flight Dec 21, 2004](#)
- » [Bell 210 FAA Certification Awarded Jul 21, 2005](#)
- » [USMC Takes Delivery of AH-1Z/UH-1Y Oct 25, 2005](#)
- » [TH-1H First Helicopter delivered to USAF Nov 11, 2005](#)
- » [412 LUH Ready and Able Dec 08, 2005](#)
- » [Bell 412 LUH Global Rescue Jan 23, 2006](#)
- » [First Production H-1 Helicopters Rollout Sep 27, 2006](#)

See Also:

- » [Hueys in Vietnam - Camp Holloway](#)
- » [VH-1 - Presidential Hueys](#)
- » [Bell 209 AH-1 Cobra - The attack variant](#)
- » [AH-1Z](#)

User Contributed Notes

[Database Main Index](#)

[Add note to this page](#)

Learn to Fly Helicopters

Find out how to become a helicopter pilot. Search flight schools.
www.Aopa.org/letssofarflying/heli

Blackhawk Helicopter

Need Blackhawk Helicopter? Check Our Great Resources.Dont Miss
www.goodwilltoo.com

Helicopter Training

Finding Helicopter Training Solutions Is Easy. Start Here!
domylo.net/HelicopterTraining

Helicopters in Florida

Need a Helicopter near Florida? We bring the operators to you.
jobs4helicopters.com

Ads by Google

Helicopter History Site - www.helis.com - Online since 1997 - Designed for Firefox @ 1024x768 - Privacy Statement
 This page downloaded 13 Mar 2009 10:06:46 MDT



Steven Fahey

From: "Ted Burgoin" <ted@aerodesign.ca>
To: <steve@aerodesign.ca>; "jeff" <jeff@aerodesign.ca>
Sent: Thursday, March 12, 2009 12:35 PM
Subject: Fw: FAA Validation of TCCA STC SH07-56, FAA Project ST6251NY-R

----- Original Message -----

From: "Staal, Jack" <jack.staal@tc.gc.ca>
 To: <ted@aerodesign.ca>
 Sent: Monday, March 09, 2009 2:46 PM
 Subject: FW: FAA Validation of TCCA STC SH07-56, FAA Project ST6251NY-R

Hi Ted,

Attached comments from the FAA. I need to pull the file and review.

I expected the UH-1 comments as we didn't address the UH-1 on our STC. The FAA want the specific FAA TCDS for the UH-1 and it's certification basis reviewed.

Regarding the 412HP I guess we will have to drop that from the FAA application if it is not on the FAA TCDS. I will check or have you checked?

I will review the comments further. In the meantime do you want the UH-1 to remain??

Thanks,
 J.H. (Jack) Staal
 Aircraft Certification Technologist | Technologue, Certification des
 aeronefs.
 Prairie and Northern Region | Region des Prairies et du Nord

Telephone | telephone: (780)495-5227
 Facsimilie | telecopier: (780)495-7963
 Email | courriel: jack.staal@tc.gc.ca
 TTY / ATS : 1-888-675-6863

Transport Canada | Transports Canada
 1100- 9700, Jasper Avenue | avenue Jasper (RAED)
 Edmonton, AB T5J 4E6
 Government of Canada | Gouvernement du Canada
 To provide feedback to TCCA, use CAIRS. See:
 <<http://www.tc.gc.ca/CivilAviation/ManagementServices/QA/cairs.htm>>

Pour tout commentaire a TCAC, utiliser CAIRS. Voir
 <<http://www.tc.gc.ca/AviationCivile/ServicesdeGestion/AQ/ssqac.htm>>

-----Original Message-----

From: Leung.Lee@faa.gov [mailto:Leung.Lee@faa.gov]

Sent: Wednesday, March 04, 2009 3:57 PM

To: Staal, Jack

Cc: Ray.Reinhardt@faa.gov

Subject: Re: FAA Validation of TCCA STC SH07-56, FAA Project ST6251NY-R

Mr. Staal:

This is in reference to your STC validation request for TCCA STC No. SH07-56 Issue 2,
FAA project no. ST6251NY-R:

We have comments to the FAA Form 8110-12 and the application letter submitted with this STC validation request as follows:

1. 8110-12 lists model 412HP, but we could not find FAA TCDS for this model.
2. We cannot accept UH-1 series as listed in the 8110-12. The 8110-12 should specify the specific models of UH-1 per the FAA TCDS.
3. Compliance statement(s) to the FAA TCDS certification basis for all model aircraft is required.

Note that the application letter includes a compliance statement to the FAA TCDS H1SW for
Bell model 205A-1 & 205B only.

Regards,

Leung Lee
NYACO



Transport
Canada

Transports
Canada

1100-9700 Jasper Avenue
Edmonton, Alberta

Your file Votre référence

January 9, 2009

Our file Notre référence
C-08-0892
SH07-56

Department of Transportation
Federal Aviation Administration
New York Aircraft Certification Office
1600 Stewart Avenue, Suite 410
Westbury, NY 11590.

Attention: Mr. A. Socias, Manager

**SUBJECT: Application for FAA Supplemental Type Certificate
 Installation of Quick Release Provisions; Cargo Basket; Step**

We have received an application from a Canadian resident, Aero Design Ltd., for the issue of a Canadian Supplemental Type Certificate (STC) and an FAA STC to cover Installation of Quick Release Provisions; Cargo Basket; Step on Rotorcraft.

We have reviewed the applicant's submission and certify that the design change complies with the basis of certification specified in Canadian Type Certificate H-86,. We have issued STC SH07-56, issue #2, dated September 30, 2008 . We also confirm that compliance is demonstrated with FAA Type Certificate H1SW, unless additional technical conditions are applied by the FAA.

Please consider this to be a formal application for an FAA STC under the provision of the Canada/U.S. Bilateral Airworthiness Agreement. In support of this application, please find attached the documents, as listed on the attached letter from AERO Design Ltd., dated 29 October 2008. A PDF copy of the ICA's are on the included disc.

Yours truly,

J. Staal
Aircraft Certification Engineering Technologist
Prairie and Northern Region
Phone: 780-495-5227
Facs: 780-495-7963

enclosure(s)

cc: **Aero Design Ltd.**

SENDER ACCOUNT NO. N° DE COMPTE DE L'EXPÉDITEUR 4367155		IMPORTANT - TÉLÉPHONE (403) 250 8027	
SENDER (FROM) / EXPÉDITEUR (DE) AERO DESIGN		MO DY/JR YR/AN 10/30/08	
STREET ADDRESS / ADRESSE (N° ET RUE) 2013 39 AVE NE		APT., SUITE / APP., BUREAU	
CITY / VILLE CALGARY	PROV./STATE/ÉTAT ALTA	POSTAL / ZIP T2E 6R7	
RECEIVER (TO) / DESTINATAIRE (A) TRANSPORT CANADA			
STREET ADDRESS / ADRESSE (N° ET RUE) 9700 JASPER AVE.		APT., SUITE / APP., BUREAU 11TH FLOOR	
CITY / VILLE EDMONTON	PROV./STATE/ÉTAT AB	POSTAL / ZIP T5J 4E6	
ATTN: (NAME / DEPT.) / À L'ATTENTION DE (NOM / SERVICE) JACK STAAL		IMPORTANT - TÉLÉPHONE (780) 955 227	
DESCRIPTION (INCLUDING DANGEROUS GOODS / INCLUANT MARCHANDISES DANGEREUSES) DOCUMENTS			
SENDER REFERENCE (IF ANY) / REF. DE L'EXPÉD. 8494 76560008		PICK-UP / CUEILLETTE - N° DE CONF. 8494 76560008	

SENDER SIGNATURE / SIGNATURE DE L'EXPÉDITEUR

X SEE CONDITIONS OF CARRIAGE ON REVERSE / CONDITIONS DE TRANSPORT AU VERSO X

SHIP MODE / MODE DE TRANSPORT			
AIR AÉRIEN <input type="checkbox"/>		GROUND ROUTIER <input checked="" type="checkbox"/>	
PKG / EMBAL.		SERVICE	
1 CHOOSE CHOISIR	PURO- LETTER <input checked="" type="checkbox"/>	1 PIECE ONLY PIECE SEULEMENT	9 AM 9 h <input type="checkbox"/>
	PURO- PAK <input type="checkbox"/>		10:30 AM 10 h 30 <input type="checkbox"/>
	OTHER AUTRE <input type="checkbox"/>		SAT. SAM. <input type="checkbox"/>
	PAYMENT / PAIEMENT		
CASH COMPTANT <input type="checkbox"/>		CREDIT CARD CARTE DE CREDIT <input type="checkbox"/>	
RECEIVER OR THIRD PARTY ACCOUNT NO. / N° DE COMPTE DU DESTINATAIRE OU TIERS			
RECEIVER DESTINA- TAIRE <input type="checkbox"/>		3RD PARTY TIERS <input type="checkbox"/>	
SENDER EXPÉDITEUR <input checked="" type="checkbox"/>			
SHIPMENT / DÉTAILS / EXPÉDITION			
#/Nbre PCS (4 MAXIMUM) 1	WEIGHT / POIDS SUBJ. TO CORR. / SUJET À CORR.		
	KG	LB	
DECLARED VALUE / VALEUR DÉCLARÉE (SURCHARGE APPLIES OVER \$100) (SUPPLÉMENT AU-DESSUS DE 100 \$) \$ 5,000 MAX. MAX 5 000 \$			
SEE CONDITIONS OF CARRIAGE ON REVERSE/ CONDITIONS DE TRANSPORT AU VERSO			

BILL OF LADING NO.
NOT NEGOTIABLE
N° DE CONNAISSANCE
NON NEGOCIABLE

2747 320 2896



1 888 SHIP-123

www.purolator.com

COURIER INITIALS
INITIALES DU COURRIER☒ S SCOURIER ROUTE
ITINÉRAIRE DU COURRIER

255

MO DY/JR YR/AN

10/30/08

NO./N°

TYPE ☐ VISA ☐ MC ☐ AMEX

EXP. DATE D'EXP.

CHARGES
FRAIS

TOTAL AMOUNT / MONTANT TOTAL

THIRD PARTY BILLING NAME & ADDRESS / FACTURATION À UN TIERS (NOM & AD)

LIMITATION OF LIABILITY - IMPORTANT - PLEASE READ
THE AMOUNT OF ANY LOSS OR DAMAGE FOR WHICH THE CARRIER MAY BE LIABLE SHALL NOT EXCEED \$2.00 PER POUND (OR \$4.41 PER KILOGRAM) COMPUTED ON THE TOTAL WEIGHT OF THE SHIPMENT UNLESS A HIGHER VALUE IS DECLARED ON THE FACE OF THE BILL OF LADING BY THE CONSIGNOR (SENDER). MAXIMUM DECLARED VALUE SHALL NOT EXCEED \$5,000. N.B. NOTE CAREFULLY CONDITIONS ON BACK HEREOF INCLUDING LIMITATIONS AND EXCLUSIONS OF CARRIER'S LIABILITY, WHICH ARE HEREBY ACCEPTED.

LIMITATION DE RESPONSABILITÉ - IMPORTANT - LISEZ S.V.P.
LE MONTANT DE TOUTE Perte OU DOMMAGE DONT LE TRANSPORTEUR POURRAIT ÊTRE RESPONSABLE NE DOIT PAS EXCÉDER 2.00 \$ LA LIVRE (OU 4.41 \$ LE KILOGRAMME), CALCULÉ SUR LE POIDS TOTAL DE L'EXPÉDITION, À MOINS QU'UNE VALEUR SUPÉRIEURE N'AIT ÉTÉ DÉCLARÉE SUR LE RECTO OU CONNAISSANCE PAR L'EXPÉDITEUR. LA VALEUR DÉCLARÉE MAXIMALE NE DÉPASSERA PAS 5 000 \$. N.B. VEUILLEZ PRENDRE CONNAISSANCE DES CONDITIONS AU VERSO, Y COMPRIS LES LIMITATIONS ET EXCLUSIONS DE RESPONSABILITÉ DU TRANSPORTEUR, QUI SONT ACCEPTÉES PAR LES PRÉSENTES.

PLEASE REFER TO BILL OF LADING NUMBER FOR SHIPMENT STATUS / INQUIRIES.
POUR TOUT RENSEIGNEMENT, VEUILLEZ NOUS COMMUNIQUER LE NUMERO DE CONNAISSANCE.

AERO DESIGN LTD.

2013 - 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027

Fax: 403-250-8333

www.aerodesign.ca

29 October, 2008

Transport Canada
Aircraft Certification Division
800-1601 Airport Road
Calgary, Alberta
T2E 6Z8

Attn: Jack Staal

Your File : C-07-1032

Our File : SH07-56

Re: FAA STC Application for Bell Medium series Cargo Baskets

Jack,

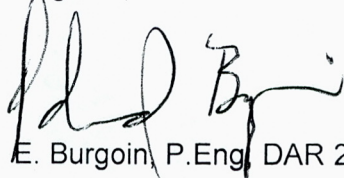
Please forward the following documents to the appropriate office of the FAA:

FAA STC Application Form	8110.12	
Modification Approval Request Application Form	MOD751	Rev. 1
Supplemental Type Certificate (TCCA)	SH07-56	Issue 2
Compliance Program	CP751	Rev. 1
Document Control List	DCL751-1	Rev. 1
Document Control List	DCL751-2	Rev. 0
Document Control List	DCL751-3	Rev. 1
Instructions for Continued Airworthiness	ICA 751.90	Rev. 0
Engineering Report	ER 751.01	Rev. 0
Test Report	TR 751.02	Rev. 0
Flight Test Report	FTR 751.03	Rev. 0
Flight Manual Supplement	FMS 751.91	Rev. 1
Cargo Basket Installation Drawing	75101	Rev. 1
Support Beams Installation Drawing	75102	Rev. 0
Cargo Basket Assembly Drawing	75110	Rev. 0
Basket Body Assembly Drawing	75111	Rev. 0
Basket Lid Assembly Drawing	75112	Rev. 0
Forward Beam Assembly Drawing	75115	Rev. 0
Aft Beam Assembly Drawing	75116	Rev. 0
Forward Beam Assembly Drawing	75130	Rev. 0
Aft Beam Assembly Drawing	75131	Rev. 0
Tube Assembly Drawing	75132	Rev. 1
Passenger Step:		
Document Control List	DCL800-1	Rev. 0
Document Control List	DCL800-11	Rev. 0
Instructions for Continued Airworthiness	ICA 800.90	Rev. 0
Engineering Report	ER 800.01	Rev. 0
Step Installation Drawing	80001	Rev. 0
Step Fabrication Drawing	80010	Rev. 0
Step Support Drawing	80020	Rev. 0
Basket Modifications:		
Document Control List	DCL704	Rev. 3
Engineering Report	ER 704.02	Rev. 0

The drawings below are available only on the CD-ROM:

Basket Components - End Hoop	75121	Rev. 0
Basket Components - Rim	75124	Rev. 0
Basket Components - Spine	75125	Rev. 0
Basket Components - Placard	75127	Rev. 0
Basket Components - Step Brace	75128	Rev. 0
Basket Components - Lug	75129	Rev. 0
Basket Components - Spine	69825	Rev. 0
Basket Components - Strut	69826	Rev. 0
Basket Components - Hoops	49210	Rev. 1
Basket Components - Rim	49212	Rev. 0
Basket Components - Lid Brace	49213	Rev. 1
Basket Components - Spacer	49215	Rev. 0
Basket Components - Spacer	49216	Rev. 0
Handle Assembly	36255	Rev. 1
Handle Bar Assembly	36261	Rev. 4
Handle Bracket Assembly	36262	Rev. 1
Handle Lever	36271	Rev. 1
Basket Bracket	36272	Rev. 1
Lid Bracket	36273	Rev. 1
Bushing	36274	Rev. 1
Bushing	36275	Rev. 2
Handle Bar	36277	Rev. 0
Spring	36278	Rev. 1
Brace	36280, Sheet 1	Rev. 2
Brace	36280, Sheet 2	Rev. 2
Lid Door Modification Drawing	70402	Rev. 1
Auxiliary Latch Modification Drawing	70403	Rev. 2
Open Forward End Modification Drawing	70404	Rev. 1
Lid Step Modification Drawing	70405	Rev. 1

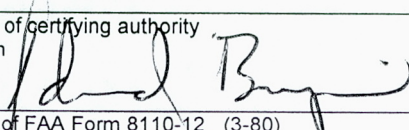
Regards,



E. Burgoin, P.Eng. DAR 290M

Encl.

No certificate may be issued unless a completed application form has been received.

U.S DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION		FORM APPROVED O.M.B. No. 04-R0078
APPLICATION FOR TYPE CERTIFICATE, PRODUCTION CERTIFICATE, OR SUPPLEMENTAL TYPE CERTIFICATE		
1. Name and address of applicant AERO Design Ltd. 2013 - 39 th Avenue NE Calgary, Alberta, Canada T2E 6R7	2. Application made for: <input type="checkbox"/> Type Certificate <input type="checkbox"/> Production Certificate <input checked="" type="checkbox"/> Supplemental Type Certificate	3. Product involved: <input checked="" type="checkbox"/> Aircraft <input type="checkbox"/> Engine <input type="checkbox"/> Propeller
4. TYPE CERTIFICATE (Complete item 4a below)		
a. Model designation(s) (All models listed are to be completely described in the required technical data, including drawings representing the design, material specifications, construction and performance of the aircraft, aircraft engine propeller which is the subject of this application.		
5. PRODUCTION CERTIFICATE (Complete items 5a - c below. Submit with this form in manual form one copy of quality control data or changes thereto covering new products as required by applicable FAR)		
a. Factory address (If different from above)	b. Application if for: <input type="checkbox"/> New Production Certificate <input type="checkbox"/> Additions to Production Certificate (Give P.C. No.)	P.C. No.
c. Applicant is holder of license under a Type Certificate or a Supplemental Type Certificate (Attach evidence of licensing agreement and give certificate number)		T.C. / S.T.C. No.
6. SUPPLEMENTAL TYPE CERTIFICATE (complete items 6a - d below)		
a. Make and model designation of product to be modified Bell Helicopter (Textron) Model 205A-1, 205B, 212, 412, 412EP, 412HP, and UH-1 series		
b. Description of modification Installation of External Cargo Basket Aluminum support beams attach to the hardpoints under the cabin. The basket can be mounted and removed from the beams without tools.		
c. Will data be available for sale or release to other persons? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		d. Will parts be manufactured for sale? (Ref: FAR 21.303) <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
7. CERTIFICATION - I certify that the above statements are true.		
Signature of certifying authority E. Burgoin Per: 	Title P.Eng, DAR 290M (AERO Design Ltd.)	Date 29 October, 2008

MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD751, Rev. 1

1. NAME AND ADDRESS OF APPLICANT: AERO Design Ltd. 2013 - 39th Avenue NE Calgary, Alberta, Canada T2E 6R7		2. IDENTIFICATION OF PRODUCT			
ALL CORRESPONDANCE TO: AERO Design Ltd. 2013 - 39th Avenue NE Calgary, Alberta T2E 6R7		MAKE: Bell Helicopter (Textron)	MODEL: 205A-1, 205B, 212, 412 series, and UH-1 series		
		SERIAL No.: All eligible	REGISTRATION: All eligible		
3. REQUEST FOR:					
A. SUPPLEMENTAL TYPE CERTIFICATE (STC) <input type="checkbox"/>					
B. STC/STA REVISION <input type="checkbox"/> STC/STA No.					
C. LIMITED SUPPLEMENTAL TYPE CERTIFICATE (LSTC) <input type="checkbox"/>					
D. LIMITED STC/STA REVISION <input type="checkbox"/> LSTC/LSTA No.					
E. F.A.A. SUPPLEMENTAL TYPE CERTIFICATE <input checked="" type="checkbox"/>					
F. F.A.A. STC REVISION <input type="checkbox"/> STC No.					
G. FAMILIARIZATION OF F.A.A. STC <input type="checkbox"/> STC No.					
H. REPAIR DESIGN APPROVAL (RDC) <input type="checkbox"/>					
I. PARTS DESIGN APPROVAL (PDA) <input type="checkbox"/>					
4. TITLE OF MODIFICATION OR REPAIR: Quick Release Cargo Basket Installation					
5. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR: Installation of Cargo Basket on right side of the helicopter. The mounting provisions are aluminum beams that attach to the existing hard points below the cabin of the helicopter. The Cargo Basket can be installed and removed from the beams without tools. An option to install a passenger step (when the basket is not mounted) is available.					
6. APPLICABLE TYPE APPROVAL (TA) OR TYPE CERTIFICATE (TC) DOCUMENTS: A. TA NO. <u>H-86, H-104 (205)</u> B. TC No. <u>H1SW (212 & 412)</u> C. OTHER <u>UH-1 (Restricted Category)</u>					
7. PROPOSED BASIS OF APPROVAL: A. SAME AS TA <input checked="" type="checkbox"/> B. SAME AS TC <input checked="" type="checkbox"/> C. OTHER <input type="checkbox"/> (Please specify) _____					
8. DOCUMENTATION CHECKLIST		REQUIRED		FOR DOT USE ONLY	
				RECEIVED	
		YES	NO	YES	NO
		DATE			
COMPLIANCE PROGRAM		X			
MASTER DRAWING LIST		X			
FLIGHT MANUAL SUPPLEMENT		X			
MAINTENANCE MANUAL SUPPLEMENT			X		
INSTRUCTIONS FOR CONTINUING AIRWORTHINESS		X			
ENGINEERING REPORTS		X			
DESIGN DRAWINGS			X		
MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS		X			
ELECTRICAL LOAD ANALYSIS			X		
DRAFT STC, LSTC OR RDA			X		
WEIGHT AND MOMENT CHANGE		X			
FLIGHT TEST DATA		X			
OTHER (Specify)			X		
9. APPLICANT'S REMARKS: STC based on Transport Canada STC # SH07-56.					
10. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4. <div style="display: flex; justify-content: space-between; align-items: flex-end; margin-top: 10px;"> <div style="width: 30%;"> <p>AERO Design Ltd.</p> <p>PER: </p> <p>SIGNATURE OF APPLICANTS</p> </div> <div style="width: 30%;"> <p>Consultant</p> <p>TITLE</p> </div> <div style="width: 30%;"> <p>29 October, 2008</p> <p>DATE</p> </div> </div>					
11. <div style="display: flex; justify-content: space-between; align-items: flex-end; margin-top: 10px;"> <div style="width: 60%;"> <p>SIGNATURE OF REGIONAL ENGINEER</p> </div> <div style="width: 30%;"> <p>DATE</p> </div> </div>					



Transport Canada

Trans Canada

Department of Transport

Supplemental Type Certificate

This approval is issued to:

Aero Design Ltd.
2013 39th Avenue North East
Calgary, Alberta
Canada T2E 6R7

Number: SH07-56**Issue No.:** 2**Approval Date:** December 24, 2007**Issue Date:** September 30, 2008**Responsible Office:**

Prairie and Northern

Aircraft/Engine Type or Model:

BELL 205A-1, 212, 412, 412 CF, 412 EP

Canadian Type Certificate or Equivalent:

H-86, H1SW

Description of Type Design Change:

Installation of Quick Release Mounting Provisions/Cargo Basket/Step on the right side or the left hand side of the helicopter.

**Installation/Operating Data,
Required Equipment and Limitations:**

Configuration A - Quick Release Mounting Provisions:

Installation of Quick Release Mounting Provisions to be accomplished in accordance with Transport Canada Civil Aviation (TCCA) approved Aero Design Ltd., Document Control List DCL751-1, Revision 1, dated 15 September 2008, or later TCCA approved revision.

Quick Release Mounting Provisions may remain installed if any other configuration is removed.

Configuration B - Quick Release Cargo Basket Installation:

Installation of Configuration A - Quick Release Mounting Provisions is a mandatory prerequisite for installation of Configuration B. Installation of Quick Release Cargo Basket to be completed in accordance with TCCA approved, AERO Design Ltd. Document Control List, DCL751-1, Revision 1, dated 15 September 2008, or later approved revision.

...See Continuation Sheet



Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.

D.S. Austen
For Minister of Transport

Canada



NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Configuration C - Quick Release Step Installation:

Installation of Configuration A - Quick Release Mounting Provisions is a mandatory prerequisite for installation of Configuration C. Installation of Quick Release Step to be completed in accordance with TCCA approved, AERO Design Ltd. Document Control List, DCL800-1, Revision 0, dated 15 September 2008, or later approved revision.

TCCA accepted, AERO Design Ltd. Instructions for Continued Airworthiness ICA800.90, Revision 0, dated 17 July 2008, or later accepted revision is required with installation of the quick release step.

Cargo Basket Modifications:

Modifications to the cargo basket configuration are eligible in accordance with TCCA approved, AERO Design Ltd. Document Control List DCL704, Revision 3, dated 31 July, 2008, or later approved revision. Eligibility limitations are noted on the drawings.

Data Pertinent to All Configurations:

TCCA approved, Aero Design Ltd. Flight Manual Supplement FMS751.91, Revision 1, dated 16 July, 2008, or later approved revision is required with this installation.

TCCA accepted, AERO Design Ltd. Instructions for Continued Airworthiness ICA751.90, Revision 0, dated 06 September 2007, or later accepted revision is required with this installation.

Certification Basis: FAR 29 at amendment 29-2, plus select sections of later amendments. (Bell 412 CF basis of certification).

— End —

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
75101	Quick Release Cargo Basket Installation	1
75102	Quick Release Provisions Installation	0
ICA751.90	Instructions for Continued Airworthiness	0
FMS751.91	Flight Manual Supplement	1
FABRICATION DOCUMENTS		
DCL751-2	Document Control List for Quick Release Cargo Basket	0
DCL751-3	Document Control List for Beams	1
ENGINEERING DOCUMENTS		

APPROVAL: Transport Canada Transports Canada <hr/> AIRCRAFT CERTIFICATION DIVISION <hr/> APPROVED By <u>D.S. Austin</u> Appl. No. <u>SH07-S6</u> Appl. Date <u>07-12-24</u> Issue No. <u>2</u> Issue Date <u>08-09-30</u> <small>YY-MM-DD</small>	ORIGINAL DATE: 6 September, 2007 REVISION DATE: 15 September, 2008	<div style="text-align: center;"> AERO DESIGN LTD. 2013 – 39th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333 </div> <hr/> <div style="text-align: center;"> Bell 205A-1 / 212 / 412 Quick Release Cargo Basket Installation </div> <hr/> <div style="display: flex; justify-content: space-between;"> <div style="width: 60%; text-align: center;"> <h2 style="margin: 0;">DCL751-1</h2> </div> <div style="width: 35%; text-align: center;"> Rev. <h2 style="margin: 0;">1</h2> </div> </div>
--	---	---

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
80001	Quick Release Step Installation	0
ICA800.90	Instructions for Continued Airworthiness	0
FMS751.91	Flight Manual Supplement	1
FABRICATION DOCUMENTS		
DCL800-11	Document Control List for Quick Release Step	0
ENGINEERING DOCUMENTS		
APPROVAL:		
 <div style="display: inline-block; vertical-align: top; margin-left: 10px;"> Transport Canada AIRCRAFT CERTIFICATION DIVISION APPROVED By <u>D. S. [Signature]</u> Appr'l No. <u>SW07-56</u> Appr'l Date <u>07-12-24</u> Issue No. <u>2</u> Issue Date <u>08-09-30</u> <small>YY - MM - DD</small> </div>	ORIGINAL DATE: 15 September, 2008 REVISION DATE:	AERO DESIGN LTD. 2013 - 39 th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333 www.aerodesign.ca
	SHEET 1 OF 1	Bell 205A-1 / 212 / 412 Quick Release Step Installation
	DCL800-1	
	Rev. 0	

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA 800.90

QUICK RELEASE STEP

Preface

These Instructions for Continued Airworthiness shall be included in the rotorcraft Maintenance Manual when the Quick Release Step assembled in accordance with AERO Design Ltd. Document Control List DCL800-11, Revision 0, or later approved revision, is installed.

The information contained herein supplements the information in the basic Maintenance Manual. For Maintenance practices and procedures not contained in these Instructions for Continued Airworthiness refer to the basic Maintenance Manual and its approved supplements.

Revision 0
Date: 17 July, 2008

AERO Design Ltd.
Engineering Consultants

2013 – 39th Avenue N.E., Calgary, Alberta T2E 6R7
Phone: (403) 250-8027
Fax: (403) 250-8333
E-Mail: infor@aerodesign.ca

Notice: This report contains information and data which is proprietary to AERO Design Ltd. This report, or any portion thereof, may not be reproduced, copied, duplicated or used without the written consent of AERO Design Ltd.

RECORD OF REVISIONS

Revision Number	Issue Date	Date Inserted	By
0			Original Issue

LIST OF EFFECTIVE PAGES

List of Revisions

Revision 0 (Original Issue) 17 July, 2008

List of Effective Pages

<u>Description</u>	<u>Pages</u>	<u>Revision No.</u>
Cover	1	0
Revision Record/List of Effective Pages	2	0
Table of Contents	3	0
00-00-00	4-5	0
04-00-00	6	0
05-00-00	7-9	0
11-00-00	10	0
25-50-00	11-13	0

TABLE OF CONTENTS

RECORD OF REVISIONS	2
LIST OF EFFECTIVE PAGES	2
CHAPTER 0 – INTRODUCTION	4
0-1 SCOPE	4
0-2 DEFINITIONS AND ABBREVIATIONS	4
0-3 DISTRIBUTION	4
0-4 COMPATIBILITY	4
0-5 GENERAL DESCRIPTION	5
CHAPTER 4 - AIRWORTHINESS LIMITATIONS	6
CHAPTER 5 – INSPECTION REQUIREMENTS	7
5-1 INSPECTION SCHEDULE	7
5-2 DAMAGE LIMITS / REPAIR INSTRUCTIONS	8
5-3 PROTECTIVE TREATMENT INFORMATION	9
CHAPTER 25 – EQUIPMENT AND FURNISHINGS	10
25-1 STEP INSTALLATION	10
25-2 STEP REMOVAL	10
25-3 WEIGHT AND BALANCE	11
25-4 STRUCTURAL FASTENER DATA	11

CHAPTER 0 – INTRODUCTION

0-1 SCOPE

The following Instructions for Continued Airworthiness (ICA) satisfy the requirements of 14 CFR 29.1529, and provide the information necessary to complete the on-going maintenance and inspections required for rotorcraft embodying the Quick Release Step as described herein.

0-2 DEFINITIONS AND ABBREVIATIONS

ICA - Instructions for Continued Airworthiness

LH - Left Hand

RH - Right Hand

0-3 DISTRIBUTION

Copies of this ICA and amendments shall be distributed to all known purchasers of the Quick Release Step. Requests for a copy may be made in writing to:

AERO Design Ltd.
2013 39th Avenue N.E.
Calgary, Alberta
T2E 6R7
Fax: 403-250-8333
Email: info@aerodesign.ca

Any changes will be sent to Transport Canada. All changes will be recorded in the Record of Revisions page at the front of this document.

0-4 COMPATIBILITY

Prior to incorporating this modification, the installer shall establish that the inter-relationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the helicopter.

0-5 GENERAL DESCRIPTION

The Quick Release Step installation consists of a step assembly which is attached to quick release mounting provisions provided on the helicopter. These mounting provisions are capable of mounting various equipment including cargo baskets.

The step itself consists of an aluminum extrusion attached to brackets on the ends with fittings that lock into the quick release mechanism.

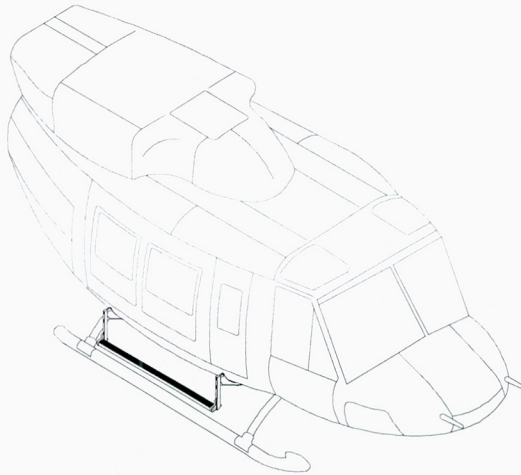


Figure 2 – Bell Medium Step Installation

CHAPTER 4 - AIRWORTHINESS LIMITATIONS

The Airworthiness Limitations section is Transport Canada-approved and specifies maintenance required under Section 571 of the Canadian Aviation Regulations, unless an alternative program has been approved.

No additional airworthiness limitations have been imposed due the installation of the Quick Release Step.

CHAPTER 5 – INSPECTION REQUIREMENTS

5-1 INSPECTION SCHEDULE

Continued airworthiness is contingent upon compliance with the following inspection items. These items shall be completed in conjunction with the rotorcraft Maintenance Inspection schedule, or other approved program, or upon removal and replacement of any component of Quick Release Step.

Daily Inspection

1. Inspection Area: Step
 - a) Inspect the step attachment to the beams for condition and security. Ensure quick release mechanism is completely extended, flush with the outboard surface of the beam.

300 Hour or Annual Inspection

Refer to the ICA for the Quick Release Cargo Basket for each specific model of helicopter for inspection of mounting provisions.

1. Inspection Area: Step
 - a) Visually inspect welds attaching end brackets to step extrusion for cracks, corrosion or other damage.
 - b) Visually inspect step for damage.
 - c) Visually inspect lugs attaching the step to the beams for security and damage.

Special Inspections

Following a hard landing inspect the Quick Release Step installation in accordance with the 300 hour or annual inspection listed above.

5-2 DAMAGE LIMITS / REPAIR INSTRUCTIONS

Refer to the ICA for the Quick Release Cargo Basket for each specific model of helicopter for further limits and repair instructions.

If damage is found in the inspections above, repair in accordance with the instructions below.

1. Step Assembly

Part	Type of Damage	Max. Allowable	Repair
Step End Bracket	Corrosion	0.010" deep	Blend up to 0.010" deep with scotchbrite.
	Scratches / Nicks	0.010" deep x 0.5" long	Blend up to 0.010" deep with scotchbrite.
	Cracks/Dents	None	N/A
	Bent Lugs	None	N/A
Centre Step Section	Corrosion	2" x 2" x 0.010" deep	Blend up to 0.010" deep with scotchbrite.
	Scratches / Nicks	0.010" deep x 1" long	Blend up to 0.010" deep with scotchbrite.
	Cracks / Dents	None	N/A
	Permanent Deflection of Step	0.25" max at middle of step	None

2. Steel Beams

Part	Type of Damage	Max. Allowable	Repair
Steel Beam	Corrosion	0.030" deep	Blend up to 0.030" deep with scotchbrite.
	Scratches / Nicks (Outboard face)	0.030" deep x 0.125" wide	Blend up to 0.030" deep with scotchbrite.
	Scratches / Nicks (all other sides)	0.060" deep x 0.125" wide	Blend up to 0.060" deep with scotchbrite.
	Cracks/Dents	None	N/A
	Elongation of Keyway	See figure 3	None
	Widening of slots	27/64" (0.422) diameter (check with a 27/64" drill)	None



Figure 3 – Keyway dimensions

3. Step Welds

Cracks up to 0.25" long may be repaired as follows:

- a) Clean area of paint.
- b) Grind away weld in area of crack.
- c) T.I.G. weld per MIL-STD-2219 Class "C" using ER4043 filler rod. Do not grind flush.
- d) Touch up paint as noted in section 5-3.

5-3 PROTECTIVE TREATMENT INFORMATION

1. Step Assembly

The Step Assembly is supplied powder coated white. If the powder coat is damaged, touch up with white polyurethane paint. The tread area is painted with anti-skid paint. If the anti-skid paint is damaged, touch up with Randolph X1567 Wingwalk grip paint or equivalent.

CHAPTER 25 – EQUIPMENT AND FURNISHINGS

The Quick Release Step Installation may be applied to the right and/or left side of the helicopter. Refer to the ICA for the Quick Release Cargo Basket for each specific model of helicopter for installation and removal instructions for the mounting provisions.

25-1 STEP INSTALLATION

Refer to Figure 4.

1. Set upper attachment into upper keyway in forward and aft beams.
2. Lift step until lower attachment fitting hits stop. Push fitting into keyway and slide step down until locked.

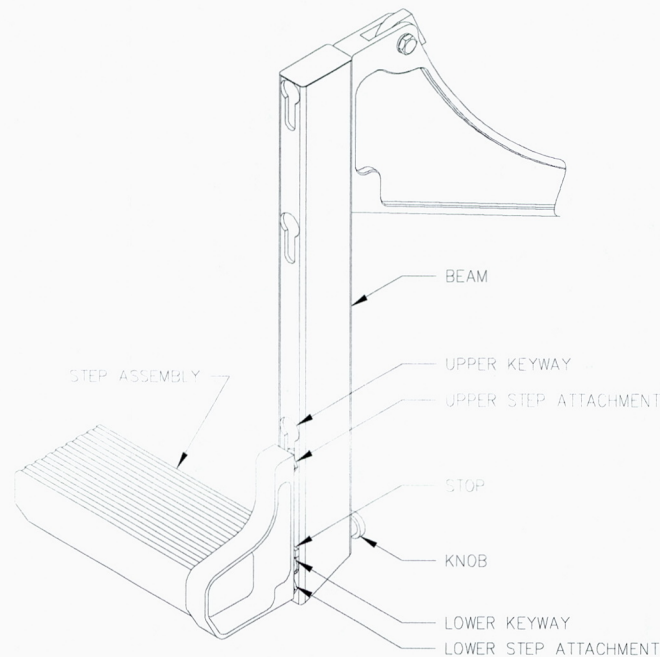


Figure 4 – Step Attachment

25-2 STEP REMOVAL

Refer to Figure 4.

1. Pull knob at bottom end of forward beam and lift step until lower attachment fitting is free of keyway. Keep upper attachment in keyway on beam.
2. Pull knob at bottom end of aft beam and lift step until lower attachment fitting is free of keyway. Keep upper attachment in keyway on beam.
3. Lift step until upper attachments are out of keyways on both beams and remove from helicopter.

25-3 WEIGHT AND BALANCE

Two weight and balance configurations are required for the pilot. The first is the installation of Provisions only. The second is Step and Provisions as the step may be removed/installed in the field by the pilot.

Bell 205A-1 / 212 / 412 Series

Configuration 1 – Provisions Only		Weight (lbs)	Longitudinal		Lateral	
Part #	Name		Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
75115-01	Forward Beam Assembly	5.0	84.5	422.5	46.0	230.0
75116-01	Aft Beam Assembly	4.6	155.1	713.5	47.3	217.6
75102-01	Provisions Installation (Total)	9.6	118.3	1136.0	46.6	447.6

Configuration 2 – Step and Provisions		Weight (lbs)	Longitudinal		Lateral	
Part #	Name		Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
75115-01	Forward Beam Assembly	5.0	84.5	422.5	46.0	230.0
75116-01	Aft Beam Assembly	4.6	155.1	713.5	47.3	217.6
80010-7100	Step	7.8	119.8	934.4	52.2	407.1
80001-01	Step Installation (Total)	17.4	119.0	2070.4	49.1	854.7

Note: Lateral arms are given for right side installation. For installation on left side, lateral arms are negative.

25-4 STRUCTURAL FASTENER DATA

Refer to Standard Practices Manual for torque values not listed in this ICA.

BELL 205A-1 / 212 / 412

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the **INSTALLATION of the AERO DESIGN** **QUICK RELEASE CARGO BASKET** **AND/OR QUICK RELEASE STEP**

Supplemental Type Certificate No. SH07-56

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 205A-1 / 212 / 412 when fitted with the Quick Release Cargo Basket or Step Installation. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.



Table of Contents

I	Limitations	3
II	Normal Procedures	3
III	Emergency Procedures	3
IV	Performance	3
V	Weight and Balance	4
VI	Installation / removal instructions	6

Record of Revisions

Revision	Issue Date	Pages Revised	Date Inserted	By
0	07 Sept, 2007	None		
1	16 July, 2008	All		

I LIMITATIONS

1. The maximum load in the AERO Design Ltd. Quick Release Cargo Basket is 300 lb. (135.7 kg).
2. Only one basket may be installed on the helicopter, on the right or left side.
3. Flight operations limited to VFR conditions with AERO Design Ltd. Quick Release Cargo Basket installed.
4. V_{NE} is unchanged from the basic rotorcraft.
5. Quick Release Step may be installed on the right and/or left side when the basket is removed. Installation on both sides is approved.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all cargo stored in the cargo basket is properly tied down and secured for flight.
 - b) Ensure that the lid of cargo basket is closed and secured.
 - c) Ensure the basket is locked in position on the beams. Pull up on the forward and aft end of the basket to check.
 - d) Ensure the step is locked in position on the beams. Pull up on the forward and aft end of the step to check.

CAUTION

It is possible to exceed the lateral centre of gravity limits of the rotorcraft under some loading conditions. Pilots must ensure that lateral C of G is within limits when loading the basket.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

IV PERFORMANCE

1. Cruise performance and range will be reduced by approximately 10 percent with the Cargo Basket installed.
2. Climb performance will be reduced by up to 150 fpm with the Cargo Basket installed.

V WEIGHT AND BALANCE

1. The following weight and balance is for the low mounted quick release cargo basket configuration, installed in accordance with drawing 75101.

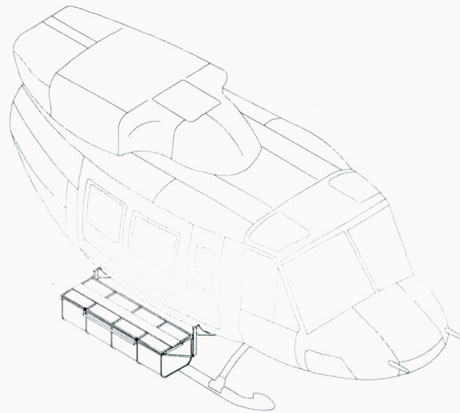


Figure 1 – Quick Release Cargo Basket Configuration

Quick Release Cargo Basket Configuration

Item	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
Basket Only ¹	49.5 lb	119.5 in	5 915 in*lb	+/- 62.2 in	+/- 3 079 in*lb
	22.4 kg	3035 mm	67 979 mm*kg	+/- 1580 mm	+/- 35 389 mm*kg
Cargo ² (MAX)	300 lb	119.5 in	35 850 in*lb	+/- 62.2 in	+/- 18 660 in*lb
	135.7 kg	3035 mm	411 991 mm*kg	+/- 1580 mm	+/- 214 480 mm*kg

¹ Weight and balance is for Cargo Basket only. Mounting beams are not included since they should have been included in the basic rotorcraft weight and balance at time of initial installation.

² Longitudinal and Lateral moment arms are given only for the center of the Cargo Basket. Due to the length of the basket, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations.

2. The following weight and balance is for the quick release step configuration, installed in accordance with drawing 80001.

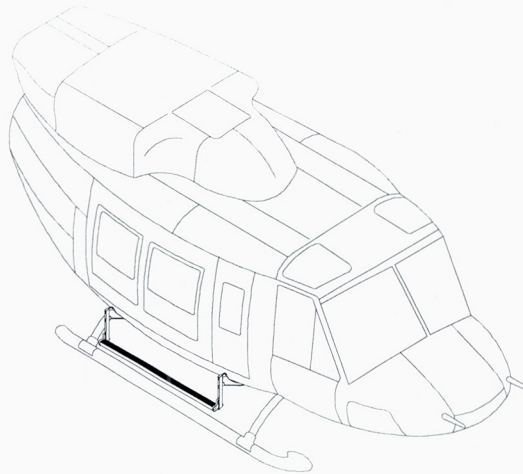


Figure 2 – Quick Release Step Configuration

Quick Release Step Configuration

Item	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
Step Only ¹	7.8 lb	119.8 in	934 in*lb	+/- 52.2 in	+/- 407 in*lb
	3.5 kg	3043 mm	10 650 mm*kg	+/- 1326 mm	+/- 4 641 mm*kg

¹ Weight and balance is for Step only. Mounting beams are not included since they should have been included in the basic rotorcraft weight and balance at time of initial installation.

VI INSTALLATION / REMOVAL INSTRUCTIONS

The Quick Release Mounting Beams are installed in accordance with drawing 75102. The Quick Release Basket is installed in accordance with drawing 75101. The Quick Release Step is installed in accordance with drawing 80001. Removal of the basket or step leaving the beams in place is an approved configuration for flight. Logbook entry indicating installation or removal of basket or step and which weight and balance amendment is in effect is required.

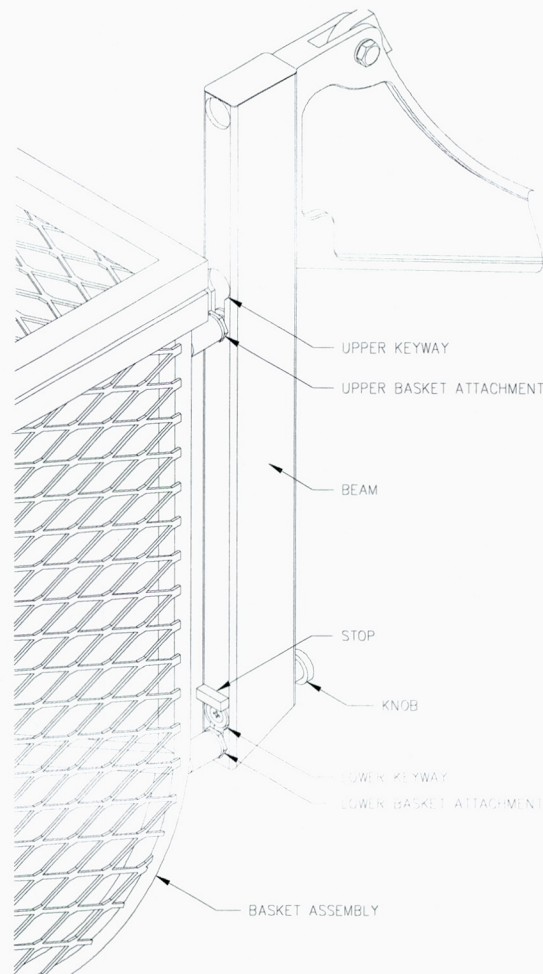


Figure 3 – Basket Attachment

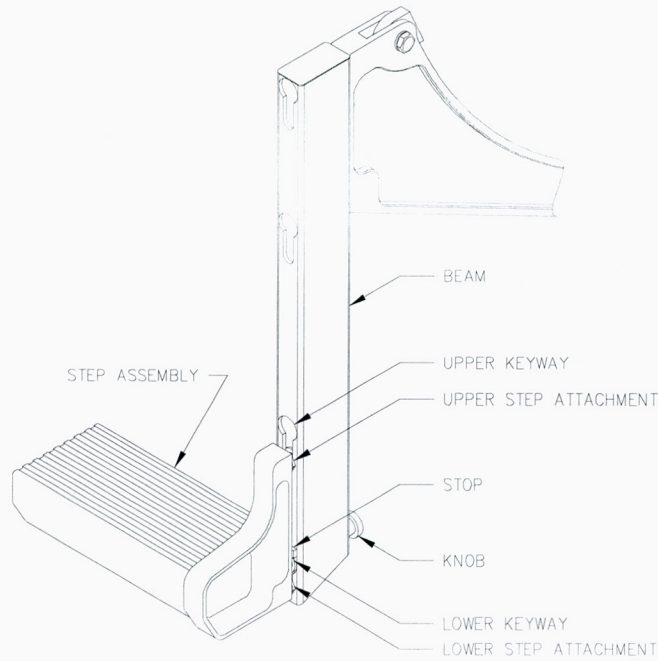


Figure 4 – Step Attachment

Installation and removal instructions are the same for the Quick Release Basket and Quick Release Step Assembly.

1. Installation - Refer to Figure 3/4.
 1. Set upper attachment into upper keyway on forward and aft beams.
 2. At forward end, lift basket or step until lower attachment fitting hits stop over keyway. Push fitting into keyway and slide down until locked. Repeat for aft end.
2. Removal - Refer to Figure 3/4.
 1. Pull knob at bottom end of forward beam and lift basket or step until lower attachment fitting is free of keyway. Keep upper attachment in keyway in beam. Repeat for aft end.
 2. Lift basket or step until upper attachments are out of keyways in beams and remove from helicopter.



Transport
Canada

Transports
Canada

1100-9700 Jasper Avenue
Edmonton, Alberta T5J 4E6

January 08, 2008

Your file Votre référence

751

Our file Notre référence

C-07-1032

SH07-56

Aero Design Ltd.
2013 39th Avenue North East
Calgary, Alberta
T2E 6R7
Canada

Dear Sirs:

**SUBJECT: SUPPLEMENTAL TYPE CERTIFICATE NO. SH07-56 – ISSUE 1 DATED
DECEMBER 24, 2007 – INSTALLATION OF ONE EXTERNAL CARGO
BASKET ON THE RIGHT HAND SIDE OR THE LEFT HAND SIDE OF THE
HELICOPTER - BELL 205A-1, 205B, 212, 412, 412CF, 412EP – ISSUED TO
AERO DESIGN LTD.**

This Supplemental Type Certificate (STC) is issued in response to your application. Included with the STC are the documents bearing the original Transport Canada signatures.

The transfer of this SH07-56 in the name of another person requires the prior approval from the Minister in accordance with Canadian Aviation Regulations (CAR) 513.25.

The requirements of CAR 561 apply where parts are manufactured and offered for sale. The provisions of CAR 571.06(4) should also be consulted.

A Canadian holder is required to report any service problem experienced with their product. Therefore, should you become aware of any defect, malfunction or failure resulting from the design change, it is your responsibility to submit a Service Difficulty Report to Transport Canada in accordance with CAR V, Subpart 91.

Yours truly,

J. Staal
Aircraft Certification Engineering Technologist
Prairie and Northern Region
Phone: 780-495-5227
Facs: 780-495-7963

Encl.

Canada



Department of Transport

Supplemental Type Certificate

This approval is issued to:

Aero Design Ltd.
2013 39th Avenue North East
Calgary, Alberta
Canada T2E 6R7

Number: SH07-56

Issue No.: 1

Approval Date: December 24, 2007

Issue Date: December 24, 2007

Responsible Office:

Prairie and Northern

Aircraft/Engine Type or Model:

BELL 205A-1, 205B, 212, 412, 412 CF, 412 EP

Canadian Type Certificate or Equivalent:

BELL 205B H-104
BELL 212, 412, 412 CF, 412 EP H-86
BELL 205A-1 H1SW

Description of Type Design Change:

Installation of one external cargo basket on the right side or the left hand side of the helicopter

**Installation/Operating Data,
Required Equipment and Limitations:**

Installation of the Quick Release Cargo Basket is to be accomplished in accordance with Transport Canada Civil Aviation (TCCA) approved Aero Design Ltd., Document Control List DCL751-1, Revision 0, dated 6 September 2007, or later TCCA approved revision.

TCCA approved Aero Design Ltd., Flight Manual Supplement FMS 751.91 Revision 0, dated 7 September 2007, or later approved revision, is applicable with this installation.

TCCA accepted Aero Design Ltd., Instructions for Continued Airworthiness ICA 751.90, Revision 0, dated 6 September 2007 or later accepted revision is applicable to this installation.

Certification Basis: FAR 29, Amendment 29-2, plus select sections of later amendments (Bell 412 CF basis of certification).

— End —

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.



F.J.B. Wright
For Minister of Transport

TRANSFER ENDORSEMENT

A transfer of ownership requires a prior approval from the Minister.

The reissue of the certificate in the name of the transferee will be contingent upon a demonstration made by the new owner that he/she can fulfill the responsibilities of the holder as described in airworthiness manual chapter 513.

TRANSFER OF OWNERSHIP

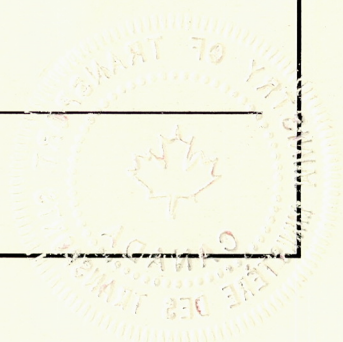
TO (NAME AND ADDRESS OF TRANSFEREE)

FROM (NAME AND ADDRESS OF OWNER)

TRANSFER PARTICULARS (LICENCE
AGREEMENT, SALE OF RIGHTS, ETC.)

DATE OF TRANSFER

SIGNATURE
(OF ORIGINAL OWNER)





Transport
Canada

Transports
Canada

1100-9700 Jasper Avenue
Edmonton, Alberta T5J 4E6

September 30, 2008

Your file Votre référence

751

Our file Notre référence

C-08-0118

SH07-56

Aero Design Ltd.
2013 39th Avenue North East
Calgary, Alberta
Canada, T2E 6R7

Dear Sirs:

**SUBJECT: SUPPLEMENTAL TYPE CERTIFICATE NO. SH07-56 – ISSUE 2 DATED
SEPTEMBER 30, 2008 INSTALLATION OF QUICK RELEASE MOUNTING
PROVISIONS/CARGO BASKET STEP ON THE RIGHT SIDE OR THE LEFT
HAND SIDE OF THE HELICOPTER – BELL 205A-1, 212, 412, 412CF,
412EP – ISSUED TO AERO DESIGN LTD.**

This Supplemental Type Certificate (STC) is issued in response to your application. Included with the STC are the documents bearing the original Transport Canada signatures.

The transfer of this SH07-56 in the name of another person requires the prior approval from the Minister in accordance with Canadian Aviation Regulations (CAR) 513.25.

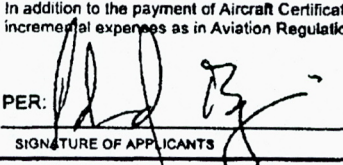
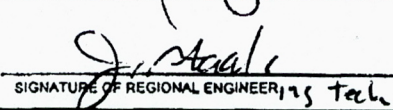
The requirements of CAR 561 apply where parts are manufactured and offered for sale. The provisions of CAR 571.06(4) should also be consulted.

A Canadian holder is required to report any service problem experienced with their product. Therefore, should you become aware of any defect, malfunction or failure resulting from the design change, it is your responsibility to submit a Service Difficulty Report to Transport Canada in accordance with CAR V, Subpart 91.

Yours truly,

J. Staal
Aircraft Certification Engineering Technologist
Prairie and Northern Region
Phone: 780-495-5227
Facs: 780-495-7963

Encl.

MODIFICATION APPROVAL REQUEST APPLICATION FORM					MOD763, Rev. 0	
1. NAME AND ADDRESS OF APPLICANT:		2. IDENTIFICATION OF PRODUCT				
AERO Design Ltd. 2013 - 39th Avenue NE Calgary, Alberta T2E 6R7		MAKE: Bell	MODEL: 205A-1, 212, 412			
ALL CORRESPONDANCE TO: AERO Design Ltd. 2013 - 39th Avenue NE Calgary, Alberta T2E 6R7		SERIAL No.: All Applicable	REGISTRATION: All Applicable			
3. REQUEST FOR:						
A. SUPPLEMENTAL TYPE CERTIFICATE (STC)		<input type="checkbox"/>				
B. STC/STA REVISION		<input checked="" type="checkbox"/> STC/STA No. SH07-56				
C. LIMITED SUPPLEMENTAL TYPE CERTIFICATE (LSTC)		<input type="checkbox"/>				
D. LIMITED STC/STA REVISION		<input type="checkbox"/> LSTC/LSTA No. Your File: C-08-0118				
E. F.A.A. SUPPLEMENTAL TYPE CERTIFICATE		<input type="checkbox"/>				
F. F.A.A. STC REVISION		<input type="checkbox"/> STC No.				
G. FAMILIARIZATION OF F.A.A. STC		<input type="checkbox"/> STC No.				
H. REPAIR DESIGN APPROVAL (RDC)		<input type="checkbox"/>				
I. PARTS DESIGN APPROVAL (PDA)		<input type="checkbox"/>				
4. TITLE OF MODIFICATION OR REPAIR: Quick Release Ski Basket Installation						
5. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR: STC No. SH07-56 is intended for the installation of a Cargo Basket onto a Bell 205A-1, 212, 412. The Cargo Basket is suitable for cargo no longer than 6 feet long. Operators conducting heli-ski operations require baskets longer than that of the original approval. This modification will add additional basket models to satisfy this requirement.						
6. APPLICABLE TYPE APPROVAL (TA) OR TYPE CERTIFICATE (TC) DOCUMENTS:						
A. TA NO. H-86		B. TC No. H1SW		C. OTHER		
7. PROPOSED BASIS OF APPROVAL:						
A. SAME AS TA <input checked="" type="checkbox"/>		B. SAME AS TC <input type="checkbox"/>		C. OTHER <input type="checkbox"/> (Please specify)		
8. DOCUMENTATION CHECKLIST		REQUIRED		FOR DOT USE ONLY		
		YES	NO	RECEIVED		
				YES	NO	DATE
COMPLIANCE PROGRAM		X				
MASTER DRAWING LIST		X				
FLIGHT MANUAL SUPPLEMENT		X				
MAINTENANCE MANUAL SUPPLEMENT			X			
INSTRUCTIONS FOR CONTINUING AIRWORTHINESS		X				
ENGINEERING REPORTS		X				
DESIGN DRAWINGS			X			
MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS		X				
ELECTRICAL LOAD ANALYSIS			X			
DRAFT STC, LSTC OR RDA		X				
WEIGHT AND MOMENT CHANGE		X				
FLIGHT TEST DATA		X				
OTHER (Specify)						
9. APPLICANT'S REMARKS:						
10. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4.						
PER: 		Consultant		07 February, 2008		
SIGNATURE OF APPLICANTS		TITLE		DATE		
11.						
				2008 Feb 7		
SIGNATURE OF REGIONAL ENGINEER				DATE		

BELL 205A-1 / 212 / 412

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the **INSTALLATION of the AERO DESIGN** **QUICK RELEASE CARGO BASKET**

Supplemental Type Certificate No. SH07-56

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 205A-1 / 212 / 412 when fitted with the Quick Release Cargo Basket Installation. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.



Table of Contents

I	Limitations	3
II	Normal Procedures	3
III	Emergency Procedures	3
IV	Performance	3
V	Weight and Balance	4
VI	Installation / removal instructions	6

Record of Revisions

Revision	Issue Date	Pages Revised	Date Inserted	By
0	07 Sept, 2007	None		

I LIMITATIONS

1. The maximum load in the AERO Design Ltd. Quick Release Cargo Basket is 300 lb. (135.7 kg).
2. Only one basket may be installed on the helicopter, on the right or left side.
3. Flight operations limited to VFR conditions with AERO Design Ltd. Quick Release Cargo Basket installed.
4. V_{NE} is unchanged from the basic rotorcraft.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all cargo stored in the cargo basket is properly tied down and secured for flight.
 - b) Ensure that the lid of cargo basket is closed and secured.
 - c) Ensure the basket is locked in position on the beams. Pull up on the forward and aft end of the basket to check.

CAUTION

It is possible to exceed the lateral centre of gravity limits of the rotorcraft under some loading conditions. Pilots must ensure that lateral C of G is within limits when loading the basket.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

IV PERFORMANCE

1. Cruise performance and range will be reduced by approximately 10 percent with the Cargo Basket Installed.
2. Climb performance will be reduced by up to 150 fpm.

V WEIGHT AND BALANCE

1. The following weight and balance is for the low mounted quick release cargo basket configuration, installed in accordance with drawing 75101.

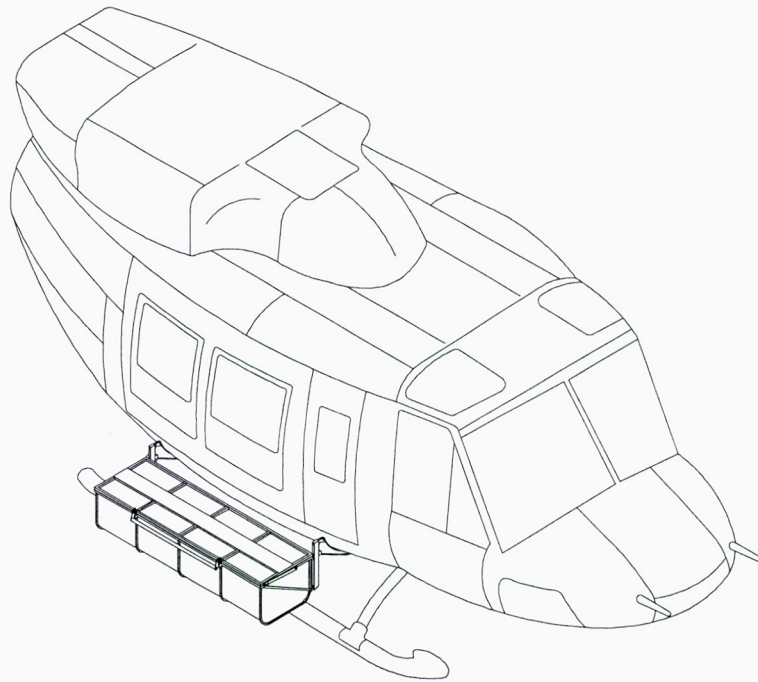


Figure 1 – Quick Release Cargo Basket Configuration

Quick Release Cargo Basket Configuration

Item	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
Cargo Basket Only ¹	49.5 lb	119.5 in	5 915 in*lb	+/- 62.2 in	+/- 3 079 in*lb
	22.4 kg	3035 mm	67 979 mm*kg	+/- 1580 mm	+/- 35 389 mm*kg
Cargo ² (MAX)	300 lb	119.5 in	35 850 in*lb	+/- 62.2 in	+/- 18 660 in*lb
	135.7 kg	3035 mm	411 991 mm*kg	+/- 1580 mm	+/- 214 480 mm*kg

¹ Weight and balance is for Cargo Basket only. Mounting beams are not included since they should have been included in the basic rotorcraft weight and balance at time of initial installation.

² Longitudinal and Lateral moment arms are given only for the center of the Cargo Basket. Due to the length of the basket, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations.

VI INSTALLATION / REMOVAL INSTRUCTIONS

The basket and beams are installed in accordance with drawing 75101. Removal of the basket leaving the beams in place is an approved configuration for flight. Logbook entry indicating installation or removal of basket and which weight and balance amendment is in effect is required when basket is installed or removed.

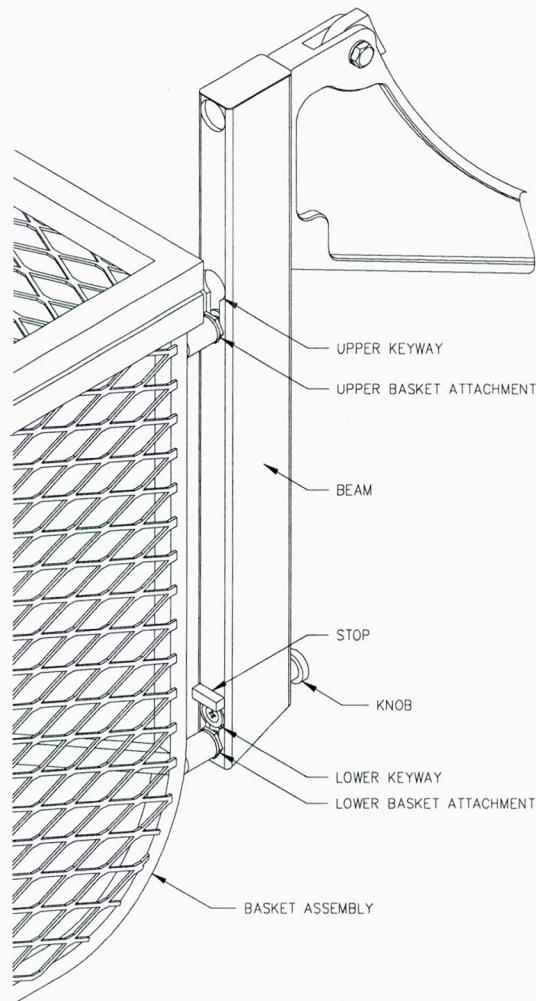





Figure 2 – Basket Attachment

1. Installation - Refer to Figure 2.
 1. Set basket upper attachment into keyway on forward and aft beams.
 2. At forward end of basket, lift until lower attachment fitting hits stop over keyway. Push fitting into keyway and slide basket down until locked. Repeat for aft end.
2. Removal - Refer to Figure 2.
 1. Pull knob at bottom end of forward beam and lift basket until lower attachment fitting is free of keyway. Keep upper basket attachment in keyway in beam. Repeat for aft end.
 2. Lift basket until upper attachments are out of keyways in beams and remove basket from helicopter.

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
75101	Quick Release Cargo Basket Installation	0
ICA751.90	Instructions for Continued Airworthiness	0
FMS751.91	Flight Manual Supplement	0
FABRICATION DOCUMENTS		
DCL751-2	Document Control List for Quick Release Cargo Basket	0
DCL751-3	Document Control List for Beams	0
ENGINEERING DOCUMENTS		
APPROVAL:		
 <div> Transport Canada Transport Canada AIRCRAFT CERTIFICATION DIVISION APPROVED By  Appr'l No. <u>SH07-56</u> Appr'l Date <u>07-12-24</u> Issue No. <u>1</u> Issue Date <u>07-12-24</u> YY-MM-DD </div>	ORIGINAL DATE: 6 September, 2007 REVISION DATE:	AERO DESIGN LTD. 2013 – 39 th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
	SHEET 1 OF 1	Bell 205A-1 / 212 / 412 Quick Release Cargo Basket Installation
	<div> DCL751-1 </div> <div> Rev. 0 </div>	

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION															
FABRICATION DOCUMENTS																	
75110	Cargo Basket Assembly	0															
75111	Basket Body Assembly	0															
75112	Basket Lid Assembly	0															
75121	Basket Components - End Hoop	0															
75124	Basket Components - Rim	0															
75125	Basket Components - Spine	0															
75127	Basket Components - Placard	0															
75128	Basket Components - Step Brace	0															
75129	Basket Components - Lug	0															
69825	Basket Components - Spine	0															
69826	Basket Components - Strut	0															
49210	Basket Components - Hoops	1															
49212	Basket Components - Rim	0															
49213	Basket Components - Lid Brace	1															
49215	Basket Components - Spacer	0															
49216	Basket Components - Spacer	0															
36255	Handle Assembly	1															
36261	Handle Bar Assembly	3															
36262	Handle Bracket Assembly	1															
36271	Handle Lever	1															
36272	Basket Bracket	1															
36273	Lid Bracket	1															
36274	Bushing	1															
36275	Bushing	2															
36277	Handle Bar	0															
36278	Spring	1															
36280, Sheet 1	Brace	2															
36280, Sheet 2	Brace	2															
ENGINEERING DOCUMENTS																	
ER751.01	Engineering Report	0															
TR751.02	Test Report	0															
<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 30%;"> <p>APPROVAL:</p>  <p>Transport Canada Transports Canada</p> <p>AIRCRAFT CERTIFICATION DIVISION</p> <p>APPROVED</p> <p>By <u>[Signature]</u></p> <p>Appr'l No. <u>SH09-59</u></p> <p>Appr'l Date <u>07-12-24</u></p> <p>Issue No. <u>1</u></p> <p>Issue Date <u>07-12-24</u></p> <p style="font-size: small;">YY - MM - DD</p> </div> <div style="width: 65%;"> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">ORIGINAL DATE:</td> <td colspan="2">6 September, 2007</td> </tr> <tr> <td>REVISION DATE:</td> <td colspan="2"></td> </tr> <tr> <td>SHEET 1 OF 1</td> <td colspan="2" style="text-align: center;"> AERO DESIGN LTD. 2013 - 39th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333 </td> </tr> <tr> <td colspan="2" style="text-align: center; vertical-align: top;"> Bell 205A-1 / 212 / 412 Quick Release Cargo Basket Assembly </td> <td style="width: 20%; vertical-align: top;">Rev.</td> </tr> <tr> <td colspan="2" style="text-align: center; font-size: 2em; font-weight: bold;">DCL751-2</td> <td style="text-align: center; font-size: 3em; font-weight: bold;">0</td> </tr> </table> </div> </div>			ORIGINAL DATE:	6 September, 2007		REVISION DATE:			SHEET 1 OF 1	AERO DESIGN LTD. 2013 - 39 th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333		Bell 205A-1 / 212 / 412 Quick Release Cargo Basket Assembly		Rev.	DCL751-2		0
ORIGINAL DATE:	6 September, 2007																
REVISION DATE:																	
SHEET 1 OF 1	AERO DESIGN LTD. 2013 - 39 th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333																
Bell 205A-1 / 212 / 412 Quick Release Cargo Basket Assembly		Rev.															
DCL751-2		0															

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
75115	Forward Beam Assembly	0
75116	Aft Beam Assembly	0
75130	Forward Beam	0
75131	Aft Beam	0
75132	Tube Assembly	0
 ENGINEERING DOCUMENTS		
ER751.01	Engineering Report	0
TR751.02	Test Report	0
<div style="display: flex; justify-content: space-between; align-items: flex-start; padding: 10px;"> <div style="width: 30%;"> <p>APPROVAL:</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <div style="display: inline-block; text-align: center;"> Transport Canada </div> <div style="display: inline-block; text-align: center;"> Transports Canada </div> </div> <p style="text-align: center;">AIRCRAFT CERTIFICATION DIVISION</p> <p style="text-align: center; font-weight: bold; font-size: 1.2em;">APPROVED</p> <p>By <u><i>[Signature]</i></u></p> <p>Appr'l No. <u>SH07-56</u></p> <p>Appr'l Date <u>07-12-24</u></p> <p>Issue No. <u>1</u></p> <p>Issue Date <u>07-12-24</u></p> <p style="text-align: center; font-size: 0.8em;">YY-MM-DD</p> </div> <div style="width: 35%;"> <p>ORIGINAL DATE: 6 September, 2007</p> <p>REVISION DATE:</p> </div> <div style="width: 30%; text-align: center;"> <p style="font-weight: bold; font-size: 1.2em;">AERO DESIGN LTD.</p> <p style="font-size: 0.8em;">2013 - 39th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333</p> </div> </div>		
SHEET 1 OF 1		Bell 205A-1 / 212 / 412 Quick Release Mounting Beams
DCL751-3		0

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.
2013 39th Avenue NE
Calgary, Alberta, T2E 6R7

DATE: 7 September, 2007
REV. No. 1 24 December, 2007

CORRESPONDANCE TO:
(If other than applicant)

MAKE: Bell
MODEL: 205A-1, 212, 412 Series

REGISTRATION: All Applicable
SERIAL No.: All Applicable

NATURE OF WORK: Installation of Side-Mounted External Cargo Basket

MODEL CERTIFICATION BASIS: FAR 29, Amendment 29-2, plus select sections of later amendments (Bell 412 CF basis of certification)
MODIFICATION CERTIFICATION BASIS: FAR 29, Amendment 29-2, plus select sections of later amendments (Bell 412 CF basis of certification)

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.				
Subpart B – Flight					
29.27	2	Centre of Gravity Limits	N/A		
29.29	2	Empty Weight and Corresponding C of G	Data specified on inst'n drawing	X	No change from Type Approval.
29.45	2	Performance - General	Flight Test	X	
29.51	2	Takeoff data: General	Flight Test	X	
29.63	2	Takeoff: Category B	Flight Test	X	
29.65	2	Category B Climb: All Engines Operating	Flight Test	X	
29.71	2	Helicopter Angle of Glide: Category B	Flight Test	X	
29.73(b)	2	Performance at Min. Operating Speed	Flight Test	x	
29.75	2	Landing	Flight Test	X	
29.141	2	Flight Characteristics – General	Flight Test	X	
29.143	2	Controllability and Maneuverability	Flight Test	X	
29.151	24	Flight Controls	Flight Test	X	
29.161	24	Trim Control	Flight Test	X	
29.171	2	Stability – General	Flight Test	X	
29.173	2	Static Longitudinal Stability	Flight Test	X	
29.175	2	Demonstration of Longitudinal Stability	Flight Test	X	
29.241	2	Ground Resonance	Flight Test	X	
29.251	2	Vibration	Flight Test	X	

per FTR from M. Brulotte *

Flight test in accordance with FTP751.03

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

Airworthiness Requirement Paragraph	Subject for Compliance or Documentary Proof Amdt.	Form of Substantiation	DOT	DAR	Comments
Subpart C – Strength Requirements					
29.301	2	Loads – Air Drag Loads	Analysis	X	
29.301	2	Loads – Inertia Loads	Compliance with 29.337 and 29.561	X	
29.303	2	Factor of Safety	Analysis	X	
29.305	2	Strength and Deformation	Analysis and Test iaw AC 43.13-1B	X	
29.307	2	Proof of Structure	Analysis and Test iaw AC 43.13-1B	X	
29.337(a)	2	Limit Maneuvering Load Factor – Positive	Analysis and Test iaw AC 43.13-1B	X	Critical load factor in downward direction.
29.547	2	Main Rotor Structure	Flight Test	X	
29.561	2	Emergency Landing Conditions	Analysis and Test iaw AC 43.13-1B	X	
29.561(b)3(i)	2	Emergency Landing Conditions – Up	Analysis and Test iaw AC 43.13-1B	X	
29.561(b)3(ii)	2	Emergency Landing Conditions – Fwd	N/A	X	Forward deflection or failure of basket poses no threat to occupants.
29.561(b)3(iii)	2	Emergency Landing Conditions – Side	Analysis and Test iaw AC 43.13-1B	X	
29.561(b)3(iv)	2	Emergency Landing Conditions – Down	Compliance with 29.337	X	29.337 Maneuvering Load is Critical.
Subpart D – Design and Construction					
29.601	2	Design	Drawings	X	Design is conventional.
29.603	2	Materials	Drawings	X	Materials used are specified in Mil-Hdbk-5J.
29.605	2	Fabrication Methods	Drawings	X	Design is conventional.
29.609	2	Protection of Structure	Drawings	X	
29.611	2	Inspection Provisions	Drawings	X	Design is easy to inspect.
29.613	2	Material Strength Properties and Design Values	Values used as per Mil-Hdbk-5J	X	
29.625	2	Fitting Factor	Analysis	X	
29.783	2	Doors	N/A	X	Installation does not block doors.
29.787(a)	2	Cargo and Baggage Compartments	Compliance with 23.301 through 307	X	
29.787(b)	2	Cargo and Baggage Compartments	Design	X	Basket is a closed container.
29.787(c)	2	Cargo and Baggage Compartments	N/A	X	Cargo is external to helicopter.
29.807	2	Emergency Exits	N/A	X	Installation does not block doors.
29.1387	9	Position Light System Dihedral Angles	N/A – statement in report		No change from Type Approval.
29.1401	11	Anticollision Light System	N/A – statement in report		No change from Type Approval.

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.				
Subpart G – Operating Limitations and Information					
29.1505	3	Never Exceed Speed	Flight Test,		
			Flight Manual Supplement		
29.1525	2	Kinds of Operation	Flight Manual Supplement		
29.1529	2	Maintenance Manual	ICA Provided		
29.1557(a)	2	Miscellaneous Markings and Placards – Baggage Compartments	Placard on lid		
29.1557(b)	2	Miscellaneous Markings and Placards	N/A		
29.1557(c)	2	Miscellaneous Markings and Placards	N/A		
29.1557(d)	2	Miscellaneous Markings and Placards	N/A		
29.1581	15	Rotorcraft Flight Manual – General	Flight Manual Supplement		
29.1583(c)	2	Operating Limitations – Weight and Loading Information	Flight Manual Supplement		
29.1585	2	Operating Procedures	Flight Manual Supplement		
29.1587	2	Performance Information	Flight Manual Supplement		
29.1589	2	Loading Information	Flight Manual Supplement & Placard		

*
X } FR.
X } V_{NE} limits as specified in the existing Flight
X } Manual
X } Limited to VFR only.
X }
X }
X }

X }
X } FR.*
X }
X }
X }
X } Placard installed on basket lid

Flight Test Card for B205-A1 Equipped with Aerodesign Congo Basket

Aircraft Configuration: (check one)

Baseline ☐

Cargo Basket Installed ☐

Mass Configuration: (check one)

heavy fwd ☐

light aft ☐

1. GENERAL

Date: _____

Rotorcraft Type: B205-A1

Time Up: _____

Rotorcraft Model: _____

Time Down: _____

Registration: CFTGK

Location: _____

Serial Number: 30009

Pilot: _____

TC ETP: Michel Brulotte

Pilot License Number: _____

TC ETP License: AH422727

Flight Test Engineer: _____

2. INITIAL CONDITIONS

Altimeter Setting: _____

29.92 in Hg

← set altimeter prior to collecting data

Gross Weight: _____

Fuel: _____

Longitudinal CG: _____

Pressure Altitude: _____

Lateral CG: _____

OAT: _____

Wind Direction: _____

Wind Speed: _____

The aircraft is loaded so that the take-off gross weight and cg is the same for both flights. This can be accomplished by varying ballast weight and location and fuel load.

Aircraft Configuration: (check one)

Baseline ☐

Cargo Basket Installed ☐

Mass Configuration: (check one)

heavy fwd ☐

light aft ☐

CONTROL THROWS

Cyclic Fwd: _____

Aft: _____

Left: _____

Right: _____

Pedal L Fwd: _____

L Aft: _____

3. HOVER AND LOW SPEED – CONTROL MARGINS AT 20 KTS

Data to be recorded for 20 knots

Direction	Speed	Long Cyclic Posn	Lat Cyclic Posn	Pedal Posn	Comments (vibration?)
Hover:	0				
Left:	10				
	20				
Right:	10				
	20				
Aft:	10				
	20				

Aircraft Configuration: (check one)

Baseline ☐

Cargo Basket Installed ☐

Mass Configuration: (check one)

heavy fwd ☐

light aft ☐

4. MAXIMUM SPEED LEVEL FLIGHT, V_H AT MCP

Q – 47.5 psi; N_G – placard; ITT – 610; V_{NE} – 120 KIAS (See Placard)

V_h : _____

Hp: _____

Long Cyclic Posn: _____

OAT: _____

Latl Cyclic Posn: _____

Fuel: _____

Pedal Posn: _____

Torque: _____

5. DIVE TO V_{NE}

V_{NE} – SEE PLACARD (MAXIMUM 120); Q – 47.5 PSI; N_G – PLACARD; ITT – 610

V_{NE} : _____

Hp: _____

Longitudinal Cyclic Posn: _____

OAT: _____

Lateral Cyclic Posn: _____

Fuel: _____

~~Pedal~~ Posn: _____

Torque: _____

6. CONTROLLABILITY AT V_{NE}

Perform coordinated 30 degree angle of bank turns. There should be adequate control margins to maintain speed and precise bank angle.

Comments:

Flight Test Card for B205-A1 Equipped with Aerodesign Cango Basket

Aircraft Configuration: (check one)

Baseline ☐

Cargo Basket Installed ☐

Mass Configuration: (check one)

heavy fwd ☐

light aft ☐

7. DIVE TO V_D

The test is to verify that there are no unusual vibrations of the modification or the aircraft. When flying at speeds in excess of V_{NE} the aircraft must be manoeuvred gently to avoid overstressing the aircraft, or exceeding control capabilities of the aircraft.

1.11 V_{NE} : _____

Torque: _____

Comments: _____

8. STATIC LONGITUDINAL STABILITY – CRUISE

The static longitudinal stability tests are performed with the collective set to the position used to maintain level flight at the trim airspeed. **The collective is not adjusted during the test.**

	Airspeed	Longitudinal Cyclic Position		Torque	OAT
Trim 0.9 V_h/V_{ne} :					
Climb 0.7 V_h :					
Dive 1.1 V_h :					

Comments: _____

Fuel: _____

Aircraft Configuration: (check one)

Baseline ☐

Cargo Basket Installed ☐

Mass Configuration: (check one)

heavy fwd ☐

light aft ☐

9. STATIC LONGITUDINAL STABILITY – CLIMB AT MCP

V_y – 55 KIAS; Q – 47.5 psi; N_G – placard; ITT – 610

The static longitudinal stability tests are performed with the collective set to the position used to maintain level flight at the trim airspeed. **The collective is not adjusted during the test.**

	Airspeed	Longitudinal Cyclic Position		Torque	OAT
Trim V _y : 55					
0.85 V _y : 47					
1.2 V _y : 66					

10. STATIC LONGITUDINAL STABILITY – AUTOROTATION

N_R: 91 – 104.5%

	Airspeed	Long Cyclic Posn		Descent (fpm)	Hp
V min sink: 55					
slow: 40					
fast: 90					
V _{ne} auto: 120					

Aircraft Configuration: (check one)

Baseline ☐

Cargo Basket Installed ☐

Mass Configuration: (check one)

heavy fwd ☐

light aft ☐

11. MANEUVERING – AUTOROTATION

While in a stabilized autorotation verify that the aircraft can be manoeuvred (change speed, aircraft attitude) without unusual vibrations.

Comments:

12. STEADY HEADING SIDESLIP – CLIMB

The static lateral directional stability tests are performed with the collective set to the position used to maintain level flight with the ball centered. **The collective is not adjusted during the test.**

V_y – 55 KIAS; Q – 47.5 psi; N_G – placard; ITT – 610

Side Slip Angle		Lateral Cyclic Position	Pedal Position	Bank Angle	
Ball Centered					
½ Ball Right					
1 Ball Right					
½ Ball Left					
1 Ball Left					

Aircraft Configuration: (check one)

Baseline ☐

Cargo Basket Installed ☐

Mass Configuration: (check one)

heavy fwd ☐

light aft ☐

13. STEADY HEADING SIDESLIPS – CRUISE – 0.9 V_H

The static lateral directional stability tests are performed with the collective set to the position used to maintain level flight with the ball centered. **The collective is not adjusted during the test.**

Side Slip Angle		Lateral Cyclic Position	Pedal Position	Bank Angle	
Ball Centered					
½ Ball Right					
1 Ball Right					
½ Ball Left					
1 Ball Left					

Aircraft Configuration: (check one)

Baseline ☐

Cargo Basket Installed ☐

Mass Configuration: (check one)

heavy fwd ☐

light aft ☐

15. AUTOROTATION ENTRIES

The certification test points require that collective must not be reduced from entry position until one second after power reduction (throttle reduction to idle). The crew can perform build-up test points that use less collective delay to ensure that transient rotor speed does not decay below aircraft limits. For autorotation entries at speeds greater than V_{NE} (Power off) the pilot initiates a reduction in airspeed once the throttle has been reduced to idle (no need to delay action like on collective) to a speed not greater than V_{NE} (Power off).

Airspeed	Entry Torque	Minimum N_R during entry	Transient Characteristics
40			
55			
80			
100			
120 or V_{NE} power on			

Aircraft Configuration: (check one)

Baseline ☐

Cargo Basket Installed ☐

Mass Configuration: (check one)

heavy fwd ☐

light aft ☐

16. PERFORMANCE CLIMBS AT MCP – AEO

The climbs are performed perpendicular to prevailing winds to minimize the effects of wind shear. The aircraft is stabilized at VY and MCP power, once the climb rate has stabilized the crew starts the stop-watch and records the start altitude. The climb is continued, with the pilot adjusting collective to maintain MCP for one minute of elapsed time. The crew records the altitude at the 30 second and 60 second elapsed times. The aircraft weight for the performance climbs should be the same for the modified and unmodified configurations to allow meaningful comparisons to be made.

(V_Y – 55 KIAS; Q – 47.5 PSI; N_G – PLACARD; ITT – 610)

Time	Altitude	OAT	VSI	Fuel		
Climb Number 1	0					
	30					
	60					
Climb Number 1 - Reciprocal Heading	0					
	30					
	60					
Climb Number 2	0					
	30					
	60					
Climb Number 2 - Reciprocal Heading	0					
	30					
	60					

Aircraft Configuration: (check one)

Baseline ☐

Cargo Basket Installed ☐

Mass Configuration: (check one)

heavy fwd ☐

light aft ☐

17. OTHER OBSERVATIONS (AS APPLICABLE)

- Ground Clearance:
- Interference with external lighting:
- Interference with pilot field of view:
- Cockpit arrangements:
- Interference with normal controls:
- Interference with emergency controls:
- Others:

17. GENERAL SUMMARY

Additional comments:

Flight Test Card for B205-A1 Equipped with Aerodesign Cango Basket

Aircraft Configuration: (check one)

Baseline ☐

Cargo Basket Installed ☐

Mass Configuration: (check one)

heavy fwd ☐

light aft ☐

1. GENERAL

Date: _____

Rotorcraft Type: B205-A1

Time Up: _____

Rotorcraft Model: _____

Time Down: _____

Registration: CFTGK

Location: _____

Serial Number: 30009

Pilot: _____

TC ETP: Michel Brulotte

Pilot License Number: _____

TC ETP License: AH422727

Flight Test Engineer: _____

2. INITIAL CONDITIONS

Altimeter Setting: _____

29.92 in Hg

← set altimeter prior to collecting data

Gross Weight: _____

Fuel: _____

Longitudinal CG: _____

Pressure Altitude: _____

Lateral CG: _____

OAT: _____

Wind Direction: _____

Wind Speed: _____

The aircraft is loaded so that the take-off gross weight and cg is the same for both flights. This can be accomplished by varying ballast weight and location and fuel load.

Flight Test Card for B205-A1 Equipped with Aerodesign Cango Basket

Aircraft Configuration: (check one)

Baseline ☐

Cargo Basket Installed ☐

Mass Configuration: (check one)

heavy fwd ☐

light aft ☐

CONTROL THROWS

Cyclic Fwd: _____

Aft: _____

Left: _____

Right: _____

Pedal L Fwd: _____

L Aft: _____

3. HOVER AND LOW SPEED – CONTROL MARGINS AT 20 KTS

Data to be recorded for 20 knots

Direction	Speed	Long Cyclic Posn	Lat Cyclic Posn	Pedal Posn	Comments (vibration?)
Hover:	0				
Left:	10				
	20				
Right:	10				
	20				
Aft:	10				
	20				

Aircraft Configuration: (check one)

Baseline ☐

Cargo Basket Installed ☐

Mass Configuration: (check one)

heavy fwd ☐

light aft ☐

4. MAXIMUM SPEED LEVEL FLIGHT, V_H AT MCP

Q – 47.5 psi; N_G – placard; ITT – 610; V_{NE} – 120 KIAS (See Placard)

V_h : _____

Hp: _____

Long Cyclic Posn: _____

OAT: _____

Latl Cyclic Posn: _____

Fuel: _____

Pedal Posn: _____

Torque: _____

5. DIVE TO V_{NE}

V_{NE} – SEE PLACARD (MAXIMUM 120); Q – 47.5 PSI; N_G – PLACARD; ITT – 610

V_{NE} : _____

Hp: _____

Longitudinal Cyclic Posn: _____

OAT: _____

Lateral Cyclic Posn: _____

Fuel: _____

Pedal Posn: _____

Torque: _____

6. CONTROLLABILITY AT V_{NE}

Perform coordinated 30 degree angle of bank turns. There should be adequate control margins to maintain speed and precise bank angle.

Comments:

Flight Test Card for B205-A1 Equipped with Aerodesign Cango Basket

Aircraft Configuration: (check one)

Baseline ☐

Cargo Basket Installed ☐

Mass Configuration: (check one)

heavy fwd ☐

light aft ☐

7. DIVE TO V_D

The test is to verify that there are no unusual vibrations of the modification or the aircraft. When flying at speeds in excess of V_{NE} the aircraft must be manoeuvred gently to avoid overstressing the aircraft, or exceeding control capabilities of the aircraft.

1.11 V_{NE} : _____

Torque: _____

Comments: _____

8. STATIC LONGITUDINAL STABILITY – CRUISE

The static longitudinal stability tests are performed with the collective set to the position used to maintain level flight at the trim airspeed. **The collective is not adjusted during the test.**

	Airspeed	Longitudinal Cyclic Position		Torque	OAT
Trim 0.9 V_h/V_{ne} :					
Climb 0.7 V_h :					
Dive 1.1 V_h :					

Comments: _____

Fuel: _____

Flight Test Card for B205-A1 Equipped with Aerodesign Cango Basket

Aircraft Configuration: (check one)

Baseline ☐

Cargo Basket Installed ☐

Mass Configuration: (check one)

heavy fwd ☐

light aft ☐

9. STATIC LONGITUDINAL STABILITY – CLIMB AT MCP

V_y – 55 KIAS; Q – 47.5 psi; N_G – placard; ITT – 610

The static longitudinal stability tests are performed with the collective set to the position used to maintain level flight at the trim airspeed. **The collective is not adjusted during the test.**

	Airspeed	Longitudinal Cyclic Position		Torque	OAT
Trim V _y : 55					
0.85 V _y : 47					
1.2 V _y : 66					

10. STATIC LONGITUDINAL STABILITY – AUTOROTATION

N_R: 91 – 104.5%

	Airspeed	Long Cyclic Posn		Descent (fpm)	Hp
V min sink: 55					
slow: 40					
fast: 90					
V _{ne} auto: 120					

Aircraft Configuration: (check one)

Baseline ☐

Cargo Basket Installed ☐

Mass Configuration: (check one)

heavy fwd ☐

light aft ☐

11. MANEUVERING – AUTOROTATION

While in a stabilized autorotation verify that the aircraft can be manoeuvred (change speed, aircraft attitude) without unusual vibrations.

Comments:

12. STEADY HEADING SIDESLIP – CLIMB

The static lateral directional stability tests are performed with the collective set to the position used to maintain level flight with the ball centered. **The collective is not adjusted during the test.**

V_y – 55 KIAS; Q – 47.5 psi; N_G – placard; ITT – 610

Side Slip Angle		Lateral Cyclic Position	Pedal Position	Bank Angle	
Ball Centered					
½ Ball Right					
1 Ball Right					
½ Ball Left					
1 Ball Left					

Aircraft Configuration: (check one)

Baseline ☐

Cargo Basket Installed ☐

Mass Configuration: (check one)

heavy fwd ☐

light aft ☐

13. STEADY HEADING SIDESLIPS – CRUISE – 0.9 V_H

The static lateral directional stability tests are performed with the collective set to the position used to maintain level flight with the ball centered. **The collective is not adjusted during the test.**

Side Slip Angle		Lateral Cyclic Position	Pedal Position	Bank Angle	
Ball Centered					
½ Ball Right					
1 Ball Right					
½ Ball Left					
1 Ball Left					

Aircraft Configuration: (check one)

Baseline ☐

Cargo Basket Installed ☐

Mass Configuration: (check one)

heavy fwd ☐

light aft ☐

15. AUTOROTATION ENTRIES

The certification test points require that collective must not be reduced from entry position until one second after power reduction (throttle reduction to idle). The crew can perform build-up test points that use less collective delay to ensure that transient rotor speed does not decay below aircraft limits. For autorotation entries at speeds greater than V_{NE} (Power off) the pilot initiates a reduction in airspeed once the throttle has been reduced to idle (no need to delay action like on collective) to a speed not greater than V_{NE} (Power off).

Airspeed	Entry Torque	Minimum N_R during entry	Transient Characteristics
40			
55			
80			
100			
120 or V_{NE} power on			

Aircraft Configuration: (check one)

Baseline ☐

Cargo Basket Installed ☐

Mass Configuration: (check one)

heavy fwd ☐

light aft ☐

16. PERFORMANCE CLIMBS AT MCP – AEO

The climbs are performed perpendicular to prevailing winds to minimize the effects of wind shear. The aircraft is stabilized at VY and MCP power, once the climb rate has stabilized the crew starts the stopwatch and records the start altitude. The climb is continued, with the pilot adjusting collective to maintain MCP for one minute of elapsed time. The crew records the altitude at the 30 second and 60 second elapsed times. The aircraft weight for the performance climbs should be the same for the modified and unmodified configurations to allow meaningful comparisons to be made.

(V_Y – 55 KIAS; Q – 47.5 PSI; N_G – PLACARD; ITT – 610)

Time	Altitude	OAT	VSI	Fuel		
Climb Number 1	0					
	30					
	60					
Climb Number 1 - Reciprocal Heading	0					
	30					
	60					
Climb Number 2	0					
	30					
	60					
Climb Number 2 - Reciprocal Heading	0					
	30					
	60					

Aircraft Configuration: (check one)

Baseline ☐

Cargo Basket Installed ☐

Mass Configuration: (check one)

heavy fwd ☐

light aft ☐

17. OTHER OBSERVATIONS (AS APPLICABLE)

- Ground Clearance:
- Interference with external lighting:
- Interference with pilot field of view:
- Cockpit arrangements:
- Interference with normal controls:
- Interference with emergency controls:
- Others:

17. GENERAL SUMMARY

Additional comments:

MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD751, Rev. 0

1. NAME AND ADDRESS OF APPLICANT:		2. IDENTIFICATION OF PRODUCT				
AERO Design Ltd. 2013 - 39th Avenue NE Calgary, Alberta T2E 6R7		MAKE: Bell	MODEL 205A-1, 212. 412			
ALL CORRESPONDANCE TO: AERO Design Ltd. 2013 - 39th Avenue NE Calgary, Alberta T2E 6R7		SERIAL No. 30002, 30009	REGISTRATION C-FFJY, C-FTGK <i>STC</i> <i>JS</i>			
3. REQUEST FOR:						
A. SUPPLEMENTAL TYPE CERTIFICATE (STC)		<input type="checkbox"/>	<i>C-07-1032</i>			
B. STC/STA REVISION		<input checked="" type="checkbox"/>				
C. LIMITED SUPPLEMENTAL TYPE CERTIFICATE (LSTC)		<input checked="" type="checkbox"/>				
D. LIMITED STC/STA REVISION		<input type="checkbox"/>				
E. F.A.A. SUPPLEMENTAL TYPE CERTIFICATE		<input type="checkbox"/>				
F. F.A.A. STC REVISION		<input type="checkbox"/>				
G. FAMILIARIZATION OF F.A.A. STC		<input type="checkbox"/>				
H. REPAIR DESIGN APPROVAL (RDC)		<input type="checkbox"/>				
I. PARTS DESIGN APPROVAL (PDA)		<input type="checkbox"/>				
4. TITLE OF MODIFICATION OR REPAIR: Quick Release Cargo Basket Installation						
5. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR: Installation of Cargo Basket on right side of the helicopter. The mounting provisions are aluminum and steel beams that attach to the existing hard points below the cabin of the helicopter. The Cargo Basket can be installed and removed from the beams without tools.						
6. APPLICABLE TYPE APPROVAL (TA) OR TYPE CERTIFICATE (TC) DOCUMENTS:						
A. TA NO. H-86 B. TC No. H1SW C. OTHER						
7. PROPOSED BASIS OF APPROVAL:						
A. SAME AS TA <input checked="" type="checkbox"/> B. SAME AS TC <input type="checkbox"/> C. OTHER <input type="checkbox"/> (Please specify)						
8. DOCUMENTATION CHECKLIST		REQUIRED		FOR DOT USE ONLY		
				RECEIVED		
		YES	NO	YES	NO	DATE
COMPLIANCE PROGRAM		X				
MASTER DRAWING LIST		X				
FLIGHT MANUAL SUPPLEMENT		X				
MAINTENANCE MANUAL SUPPLEMENT			X			
INSTRUCTIONS FOR CONTINUING AIRWORTHINESS		X				
ENGINEERING REPORTS		X				
DESIGN DRAWINGS			X			
MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS		X				
ELECTRICAL LOAD ANALYSIS			X			
DRAFT STC, LSTC OR RDA		X				
WEIGHT AND MOMENT CHANGE		X				
FLIGHT TEST DATA		X				
OTHER (Specify)						
9. APPLICANT'S REMARKS:						
10. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as per Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4.						
PER <i>[Signature]</i>		Consultant		02 November, 2007		
SIGNATURE OF APPLICANTS		TITLE		DATE		
11.						
<i>[Signature]</i>				5 Nov 2007		
SIGNATURE OF REGIONAL ENGINEERING TECH.				DATE		

Transport
CanadaTransports
Canada#1100, 9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6FAXED
13 Pages

Jan 8/08

FACSIMILE

Date 8-Jan-08
No. of pages (including cover sheet) 13Our File: C-07-1032
SH07-56
Your File: 751To: **AERO DESIGN LTD.**
ATTN: TED BURGOIN
Phone (403) 250-8027
Fax Phone (403) 250-8333From Debbie Dubyk
Phone 780-495-7412
Fax Phone 780-495-7963

**SUBJECT: SUPPLEMENTAL TYPE CERTIFICATE SH07-56 – ISSUE 1 DATED
DECEMBER 24, 2007 – INSTALLATION OF ONE EXTERNAL CARGO BASKET
ON THE RIGHT SIDE OR THE LEFT SIDE OF THE HELICOPTER
BELL 205A-1, 205B, 212, 412, 412CF, 412EP – ISSUED TO AERO DESIGN
LTD.**

Hi Ted:

Please find attached advance copies the following documents pertaining to the above noted Approval:

- STC cover letter to Aero Design dated January 8, 2008.
- Supplemental Type Certificate SH07-56 – Issue 1, approved and issued December 24, 2007.
- Aero Design Ltd. Document Control List DCL751-1, Rev. 0 dated 6 September 2007, stamped approved December 24, 2007 (3 pages).
- Aero Design Ltd. Flight Manual Supplement FMS 751.91, Revision 0, dated 07 September 2007, stamped December 24, 2007.

The original copies will follow in the mail.

Debbie Dubyk

Operational Support Assistant

Canada

Transport
CanadaTransports
Canada1100-9700 Jasper Avenue
Edmonton, Alberta T5J 4E6

January 08, 2008

Aero Design Ltd.
2013 39th Avenue North East
Calgary, Alberta
T2E 6R7
Canada

Dear Sirs:

**SUBJECT: SUPPLEMENTAL TYPE CERTIFICATE NO. SH07-56 – ISSUE 1 DATED
DECEMBER 24, 2007 – INSTALLATION OF ONE EXTERNAL CARGO
BASKET ON THE RIGHT HAND SIDE OR THE LEFT HAND SIDE OF THE
HELICOPTER - BELL 205A-1, 205B, 212, 412, 412CF, 412EP – ISSUED TO
AERO DESIGN LTD.**

This Supplemental Type Certificate (STC) is issued in response to your application. Included with the STC are the documents bearing the original Transport Canada signatures.

The transfer of this SH07-56 in the name of another person requires the prior approval from the Minister in accordance with Canadian Aviation Regulations (CAR) 513.25.

The requirements of CAR 561 apply where parts are manufactured and offered for sale. The provisions of CAR 571.06(4) should also be consulted.

A Canadian holder is required to report any service problem experienced with their product. Therefore, should you become aware of any defect, malfunction or failure resulting from the design change, it is your responsibility to submit a Service Difficulty Report to Transport Canada in accordance with CAR V, Subpart 91.

Yours truly,

J. Staal
Aircraft Certification Engineering Technologist
Prairie and Northern Region
Phone: 780-495-5227
Facs: 780-495-7963

Encl.

Your file Votre référence
751
Our file Notre référence
C-07-1032
SH07-56



Transport Canada Transports Canada

Department of Transport

Supplemental Type Certificate

This approval is issued to:

Aero Design Ltd.
2013 39th Avenue North East
Calgary, Alberta
Canada T2E 6R7

Number: SH07-56

Issue No.: 1

Approval Date: December 24, 2007

Issue Date: December 24, 2007

Responsible Office:

Prairie and Northern

Aircraft/Engine Type or Model:

BELL 205A-1, 205B, 212, 412, 412 CF, 412 EP

Canadian Type Certificate or Equivalent:

BELL 205B H-104

BELL 212, 412, 412 CF, 412 EP H-86

BELL 205A-1 H1SW

Description of Type Design Change:

Installation of one external cargo basket on the right side or
the left hand side of the helicopter

Installation/Operating Data,

Required Equipment and Limitations:

Installation of the Quick Release Cargo Basket is to be accomplished in accordance with Transport Canada Civil Aviation (TCCA) approved Aero Design Ltd., Document Control List DCL751-1, Revision 0, dated 6 September 2007, or later TCCA approved revision.

TCCA approved Aero Design Ltd., Flight Manual Supplement FMS 751.91 Revision 0, dated 7 September 2007, or later approved revision, is applicable with this installation.

TCCA accepted Aero Design Ltd., Instructions for Continued Airworthiness ICA 751.90, Revision 0, dated 6 September 2007 or later accepted revision is applicable to this installation.

Certification Basis: FAR 29, Amendment 29-2, plus select sections of later amendments (Bell 412 CF basis of certification).

— End —




Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.



F.J.B. Wright
For Minister of Transport






DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION	
INSTALLATION DOCUMENTS			
75101	Quick Release Cargo Basket Installation	0	✓
ICA751.90	Instructions for Continued Airworthiness	0	✓
FMS751.91	Flight Manual Supplement	0	✓
FABRICATION DOCUMENTS			
DCL751-2	Document Control List for Quick Release Cargo Basket	0	✓
DCL751-3	Document Control List for Beams	0	✓
ENGINEERING DOCUMENTS			
APPROVAL:			
 <div style="display: flex; justify-content: space-between;"> <div> AIRCRAFT CERTIFICATION DIVISION <i>[Signature]</i> By <i>[Signature]</i> Appl No. 5407-56 Appl Date 07-12-24 Issue No. 1 Issue Date 07-12-24 <small>TC - MM - CD</small> </div> <div> Transport Canada Transport Canada </div> </div>		ORIGINAL DATE: 8 September, 2007 REVISION DATE:	AERO DESIGN LTD. 2013 - 39 th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
		SHEET 1 OF 1	Bell 205A-1 / 212 / 412 Quick Release Cargo Basket Installation
DCL751-1		Rev. <div style="font-size: 2em; font-weight: bold; text-align: center;">0</div>	

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
75110	Cargo Basket Assembly	0
75111	Basket Body Assembly	0
75112	Basket Lid Assembly	0
75121	Basket Components - End Hoop	0
75124	Basket Components - Rim	0
75125	Basket Components - Spine	0
75127	Basket Components - Placard	0
75128	Basket Components - Step Brace	0
75129	Basket Components - Lug	0
69825	Basket Components - Spine	0
69826	Basket Components - Strut	0
49210	Basket Components - Hoops	1
49212	Basket Components - Rim	0
49213	Basket Components - Lid Brace	1
49215	Basket Components - Spacer	0
49216	Basket Components - Spacer	0
36255	Handle Assembly	1
36261	Handle Bar Assembly	3
36262	Handle Bracket Assembly	1
36271	Handle Lever	1
36272	Basket Bracket	1
36273	Lid Bracket	1
36274	Bushing	1
36275	Bushing	2
36277	Handle Bar	0
36278	Spring	1
36280, Sheet 1	Brace	2
36280, Sheet 2	Brace	2
ENGINEERING DOCUMENTS		
ER751.01	Engineering Report	0
TR751.02	Test Report	0
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>APPROVAL:</p> <p> Transport Canada</p> <p>AIRCRAFT CERTIFICATION DIVISION</p> <p>APPROVED</p> <p>By <u><i>[Signature]</i></u></p> <p>Appr'l No. <u>SH 00-59</u></p> <p>Appr'l Date <u>07-12-24</u></p> <p>Issue No. <u>1</u></p> <p>Issue Date <u>07-12-24</u></p> <p>YY-MM-DD</p> </div> <div style="width: 65%;"> <p>ORIGINAL DATE: 6 September, 2007</p> <p>REVISION DATE:</p> <p>AERO DESIGN LTD. 2013 - 39th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333</p> <p>SHEET 1 OF 1</p> <p>Bell 205A-1 / 212 / 412 Quick Release Cargo Basket Assembly</p> <p>DCL751-2</p> <p>Rev. 0</p> </div> </div>		

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION										
FABRICATION DOCUMENTS												
75115	Forward Beam Assembly	0										
75116	Aft Beam Assembly	0										
75130	Forward Beam	0										
75131	Aft Beam	0										
75132	Tube Assembly	0										
ENGINEERING DOCUMENTS												
ER751.01	Engineering Report	0										
TR751.02	Test Report	0										
<table border="1"> <tr> <td colspan="2"> APPROVAL:  Transport Canada Transports Canada AIRCRAFT CERTIFICATION DIVISION APPROVED By <u>[Signature]</u> App'l No. <u>5407-56</u> App'l Date <u>07-12-24</u> Issue No. <u>1</u> Issue Date <u>07-12-24</u> YY-MM-DD </td> <td> ORIGINAL DATE: 6 September, 2007 REVISION DATE: </td> <td> AERO DESIGN LTD. 2013 - 39th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333 </td> </tr> <tr> <td colspan="2"> SHEET 1 OF 1 </td> <td> Bell 205A-1 / 212 / 412 Quick Release Mounting Beams </td> </tr> <tr> <td colspan="2"> DCL751-3 </td> <td> Rev. 0 </td> </tr> </table>			APPROVAL:  Transport Canada Transports Canada AIRCRAFT CERTIFICATION DIVISION APPROVED By <u>[Signature]</u> App'l No. <u>5407-56</u> App'l Date <u>07-12-24</u> Issue No. <u>1</u> Issue Date <u>07-12-24</u> YY-MM-DD		ORIGINAL DATE: 6 September, 2007 REVISION DATE: 	AERO DESIGN LTD. 2013 - 39 th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333	SHEET 1 OF 1		Bell 205A-1 / 212 / 412 Quick Release Mounting Beams	DCL751-3		Rev. 0
APPROVAL:  Transport Canada Transports Canada AIRCRAFT CERTIFICATION DIVISION APPROVED By <u>[Signature]</u> App'l No. <u>5407-56</u> App'l Date <u>07-12-24</u> Issue No. <u>1</u> Issue Date <u>07-12-24</u> YY-MM-DD		ORIGINAL DATE: 6 September, 2007 REVISION DATE: 	AERO DESIGN LTD. 2013 - 39 th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333									
SHEET 1 OF 1		Bell 205A-1 / 212 / 412 Quick Release Mounting Beams										
DCL751-3		Rev. 0										

AERO DESIGN LTD.

FMS751.91

BELL 205A-1 / 212 / 412**ROTORCRAFT FLIGHT MANUAL SUPPLEMENT**
for the
INSTALLATION of the AERO DESIGN
QUICK RELEASE CARGO BASKETSupplemental Type Certificate No. SH07-56

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 205A-1 / 212 / 412 when fitted with the Quick Release Cargo Basket Installation. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.



Revision 0
07 September, 2007

Page 1
TRANSPORT CANADA APPROVED

AERO DESIGN LTD.

FMS751.91

Table of Contents

I	Limitations	3
II	Normal Procedures	3
III	Emergency Procedures	3
IV	Performance	3
V	Weight and Balance	4
VI	Installation / removal instructions	6

Record of Revisions

Revision	Issue Date	Pages Revised	Date Inserted	By
0	07 Sept, 2007	None		

Revision 0
07 September, 2007

Page 2

AERO DESIGN LTD.

FMS751.91

I LIMITATIONS

1. The maximum load in the AERO Design Ltd. Quick Release Cargo Basket is 300 lb. (135.7 kg).
2. Only one basket may be installed on the helicopter, on the right or left side.
3. Flight operations limited to VFR conditions with AERO Design Ltd. Quick Release Cargo Basket installed.
4. V_{NE} is unchanged from the basic rotorcraft.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all cargo stored in the cargo basket is properly tied down and secured for flight.
 - b) Ensure that the lid of cargo basket is closed and secured.
 - c) Ensure the basket is locked in position on the beams. Pull up on the forward and aft end of the basket to check.

CAUTION

It is possible to exceed the lateral centre of gravity limits of the rotorcraft under some loading conditions. Pilots must ensure that lateral C of G is within limits when loading the basket.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

IV PERFORMANCE

1. Cruise performance and range will be reduced by approximately 10 percent with the Cargo Basket Installed.
2. Climb performance will be reduced by up to 150 fpm.

AERO DESIGN LTD.

FMS751.91

V WEIGHT AND BALANCE

1. The following weight and balance is for the low mounted quick release cargo basket configuration, installed in accordance with drawing 75101.

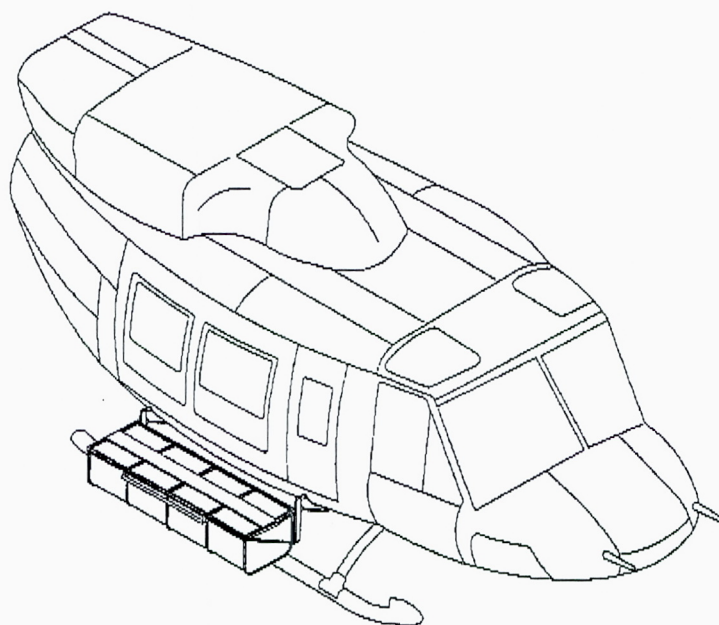


Figure 1 – Quick Release Cargo Basket Configuration

Revision 0
07 September, 2007

Page 4

AERO DESIGN LTD.

FMS751.91

Quick Release Cargo Basket Configuration

Item	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
Cargo Basket Only ¹	49.6 lb	119.5 in	5 915 in*lb	+/- 62.2 in	+/- 3 079 in*lb
	22.4 kg	3035 mm	67 979 mm*kg	+/- 1580 mm	+/- 35 389 mm*kg
Cargo ² (MAX)	300 lb	119.5 in	35 850 in*lb	+/- 62.2 in	+/- 18 660 in*lb
	135.7 kg	3035 mm	411 991 mm*kg	+/- 1580 mm	+/- 214 480 mm*kg

¹ Weight and balance is for Cargo Basket only. Mounting beams are not included since they should have been included in the basic rotorcraft weight and balance at time of initial installation.

² Longitudinal and Lateral moment arms are given only for the center of the Cargo Basket. Due to the length of the basket, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations.

AERO DESIGN LTD.

FMS751.91

VI INSTALLATION / REMOVAL INSTRUCTIONS

The basket and beams are installed in accordance with drawing 75101. Removal of the basket leaving the beams in place is an approved configuration for flight. Logbook entry indicating installation or removal of basket and which weight and balance amendment is in effect is required when basket is installed or removed.

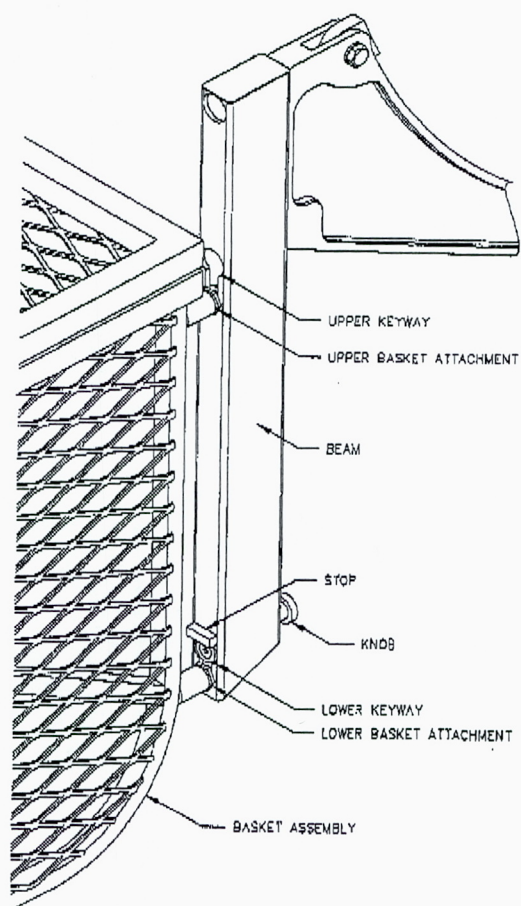


Figure 2 – Basket Attachment

Revision 0
07 September, 2007

Page 6

AERO DESIGN LTD.

FMS751,91

1. Installation - Refer to Figure 2.
 1. Set basket upper attachment into keyway on forward and aft beams.
 2. At forward end of basket, lift until lower attachment fitting hits stop over keyway. Push fitting into keyway and slide basket down until locked. Repeat for aft end.
2. Removal - Refer to Figure 2.
 1. Pull knob at bottom end of forward beam and lift basket until lower attachment fitting is free of keyway. Keep upper basket attachment in keyway in beam. Repeat for aft end.
 2. Lift basket until upper attachments are out of keyways in beams and remove basket from helicopter.

AERO DESIGN LTD.

2013 – 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027

Fax: 403-250-8333

www.aerodesign.ca

15 January, 2008

Guardian Helicopters Inc.
538 Hurricane Drive
Springbank Airport
Calgary, Alberta
T3Z 3S8

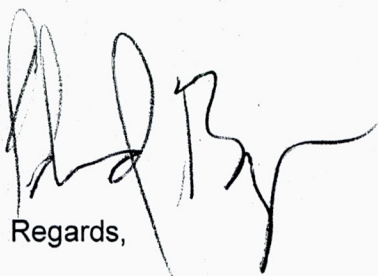
Attn: Graydon

Re: Bell Medium Quick Release Cargo Basket

Please find attached the following documents related to this project:

Supplemental Type Certificate
Document Control List
Flight Manual Supplement
Instructions for Continued Airworthiness
Installation Drawing

SH07-56	Issue 1
DCL751-1	Revision 0
FMS751.91	Revision 0
ICA751.90	Revision 0
75101	Revision 0


Regards,

E. Burgoin, P.Eng, DAR 290M

Encl.

Jeff Clarke

From: Jeff Clarke [jeff@aerodesign.ca]
Sent: Wednesday, January 02, 2008 9:47 AM
To: 'Staal, Jack'
Subject: RE: 205/212/412 cargo basket

Attachments: ER751.01_0a.pdf; AE751-1_0.pdf; AE751-2_0.pdf; AE751-3_0.pdf; CP751_1.pdf; SH07-56_draft.doc; CPR1.pdf



ER751.01_0a.pdf
(410 KB)



AE751-1_0.pdf
(394 KB)



AE751-2_0.pdf
(484 KB)



AE751-3_0.pdf
(391 KB)



CP751_1.pdf (2
MB)



SH07-56_draft.doc
(864 KB)



CPR1.pdf (662 KB)

Jack,

Please find attached the signed AE-100s for this project, the signed compliance program, and draft STC. The basis of certification is the 412CF, but only includes the paragraphs that we showed compliance with, everything else is not applicable to this installation.

I have updated the basis of certification to include the 412EP/CF in the Engineering Report, which is attached.

The CPR decision record was included with the original application. A copy is attached.

Please let me know if you need anything further.

Jeff

-----Original Message-----

From: Staal, Jack [mailto:STAALJ@tc.gc.ca]
Sent: Friday, December 21, 2007 5:00 PM
To: Jeff Clarke (E-mail); Ted Burgoin (E-mail)
Subject: 205/212/412 cargo basket
Importance: High

Hi Ted, Jeff

Could you forward the AE-100(s) and your signed Compliance Program. Also the CPR form although I could do that one.

Also need a draft STC and with the certification basis for the models 205/212/412CF-EP. This needs to be clear on the STC.

Seasons Greetings all,

J.H. (Jack) Staal
Aircraft Certification Technologist | Technologue, Certification des aeronefs.
Prairie and Northern Region | Region des Prairies et du Nord

Telephone | telephone: (780)495-5227
Facsimilie | telecopier: (780)495-7963
Email | courriel: staalj@tc.gc.ca
TTY / ATS : 1-888-675-6863

Transport Canada | Transports Canada
1100- 9700, Jasper Avenue | avenue Jasper (RAED) Edmonton, AB T5J 4E6 Government of
Canada | Gouvernement du Canada

Department of Transport

Supplemental Type Certificate

This approval is issued to:

AERO Design Ltd.
2013 39th Avenue NE
Calgary, Alberta
Canada T2E 6R7

Number: SH07-56

Issue No.: 1

Approval Date: December 24, 2007

Issue Date: December 24, 2007

Responsible Office:

Prairie and Northern

Aircraft/Engine Type or Model:

BELL 205A-1, 205B, 212, 412, 412EP, 412CF

Registration/Serial No.:

All eligible

Canadian Type Certificate or Equivalent:

H1SW (205A-1), H-104 (205B), H-86 (212, 412 Series)

Description of Type Design Change:

Installation of Quick Release Cargo Basket on the right or left side of the helicopter.

**Installation/Operating Data,
Required Equipment and Limitations:**

Installation of Quick Release Cargo Basket to be completed in accordance with Transport Canada approved, AERO Design Ltd. Document Control List, DCL751-1, Revision 0, dated 06 September 2007, or later approved revision.

Transport Canada approved, AERO Design Ltd. Flight Manual Supplement FMS751.91, Revision 0, dated 07 September, 2007, or later approved revision is required with this installation.

Transport Canada accepted, AERO Design Ltd. Instructions for Continued Airworthiness ICA751.90, Revision 0, dated 06 September, 2007, or later accepted revision is required with this installation.


Basis of certification for installation is FAR 29 at amendment 29-2; 29.1505 at amdt. 29-3; 29.1387 and amdt. 29-9; 29.1401 at amdt. 29-11; 29.1581 at amdt. 29-15; 29.151 and 29.161 at amdt. 29-24. (Same as the basis of certification for Bell 412 CF)

— End —


Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.

For Minister of Transport

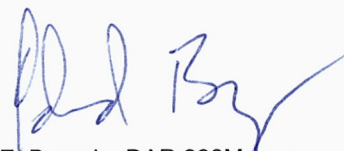
FORM AE-100

DEPARTMENT OF TRANSPORT STATEMENT OF COMPLIANCE OF AIRCRAFT OR AIRCRAFT COMPONENTS WITH THE AIRWORTHINESS REQUIREMENTS		AE-100 No.: AE751-3 Initial Issue Date: 24 December, 2007 Revision: 0 Revision Date:	
Aircraft Mfr: Bell Aircraft Model: 205A-1/212/412 Series Registration: ALL ELIGIBLE	Model / Type Airplane <input type="checkbox"/> Helicopter <input checked="" type="checkbox"/> Appliance <input type="checkbox"/> Component <input type="checkbox"/>	Approval No.: SH07-56 Delegation No.: 290M Delegate Name: E. Burgoin Company: AERO Design Ltd.	
LIST OF APPROVED REPORTS AND DATA			
Document Number	Revision	Document Title	Compliance Status
DCL751-3	0	Document Control List and all documents referred to therein	As per Compliance Program, CP751, Revision 1
ER751.01	0	Engineering Report	
TR751.02	0	Test Report	
75115	0	Forward Beam Assembly	
75116	0	Aft Beam Assembly	
75130	0	Forward Beam	
75131	0	Aft Beam	
75132	0	Tube Assembly	
DATA APPROVED BY TRANSPORT CANADA			
CERTIFICATION UNDER THE AUTHORITY VESTED IN ME BY THE DEPARTMENT OF TRANSPORT, I HEREBY CERTIFY THAT THE DATA LISTED ABOVE AND ON THE ATTACHED SHEETS NUMBERED Nil HAVE BEEN EXAMINED IN ACCORDANCE WITH ESTABLISHED PROCEDURES AND FOUND TO COMPLY, TO THE BEST OF MY KNOWLEDGE AND BELIEF WITH THE PERTINENT COMPLIANCE REQUIRMENTS. I THEREFORE <input type="checkbox"/> RECOMMEND FOR APPROVAL OF THESE DATA <input checked="" type="checkbox"/> APPROVE THESE DATA  E. Burgoin, DAR 290M			

FORM AE-100

DEPARTMENT OF TRANSPORT STATEMENT OF COMPLIANCE OF AIRCRAFT OR AIRCRAFT COMPONENTS WITH THE AIRWORTHINESS REQUIREMENTS		AE-100 No.: AE751-2 Initial Issue Date: 24 December, 2007 Revision: 0 Revision Date:		
Aircraft Mfr: Bell Aircraft Model: 205A-1/212/412 series Registration: ALL ELIGIBLE		Model / Type Airplane <input type="checkbox"/> Helicopter <input checked="" type="checkbox"/> Appliance <input type="checkbox"/> Component <input type="checkbox"/>		
		Approval No.: SH07-56 Delegation No.: 290M Delegate Name: E. Burgoin Company: AERO Design Ltd.		
LIST OF APPROVED REPORTS AND DATA				
Document Number	Revision	Document Title	Compliance Status	
DCL751-2	0	Document Control List and all documents referred to therein	As per Compliance Program, CP751, Revision 1	
ER751.01	0	Engineering Report		
TR751.02	0	Test Report		
75110	0	Cargo Basket Assembly		
75111	0	Basket Body Assembly		
75112	0	Basket Lid Assembly		
75121	0	Basket Components - End Hoop		
75124	0	Basket Components - Rim		
75125	0	Basket Components - Spine		
75127	0	Basket Components - Placard		
75128	0	Basket Components - Step Brace		
75129	0	Basket Components - Lug		
69825	0	Basket Components - Spine		
69826	0	Basket Components - Strut		
49210	1	Basket Components - Hoops		
49212	0	Basket Components - Rim		
49213	1	Basket Components - Lid Brace		
49215	0	Basket Components - Spacer		
49216	0	Basket Components - Spacer		
36255	1	Handle Assembly		
36261	3	Handle Bar Assembly		
36262	1	Handle Bracket Assembly		
36271	1	Handle Lever		
36272	1	Basket Bracket		
36273	1	Lid Bracket		
36274	1	Bushing		
36275	2	Bushing		
36277	0	Handle Bar		
36278	1	Spring		
36280, Sht. 1	2	Brace		
36280, Sht. 2	2	Brace		
DATA APPROVED BY TRANSPORT CANADA				
FTP751.03	0	Flight Test Plan and Report		
CERTIFICATION UNDER THE AUTHORITY VESTED IN ME BY THE DEPARTMENT OF TRANSPORT, I HEREBY CERTIFY THAT THE DATA LISTED ABOVE AND ON THE ATTACHED SHEETS NUMBERED Nil HAVE BEEN EXAMINED IN ACCORDANCE WITH ESTABLISHED PROCEDURES AND FOUND TO COMPLY, TO THE BEST OF MY KNOWLEDGE AND BELIEF WITH THE PERTINENT COMPLIANCE REQUIREMENTS.				
I THEREFORE <input type="checkbox"/> RECOMMEND FOR APPROVAL OF THESE DATA <input checked="" type="checkbox"/> APPROVE THESE DATA				
 E. Burgoin, DAR 290M				

FORM AE-100

DEPARTMENT OF TRANSPORT STATEMENT OF COMPLIANCE OF AIRCRAFT OR AIRCRAFT COMPONENTS WITH THE AIRWORTHINESS REQUIREMENTS		AE-100 No.: AE751-1 Initial Issue Date: 24 December, 2007 Revision: 0 Revision Date:	
Aircraft Mfr: Bell Aircraft Model: 205A-1/212/412 Series Registration: ALL ELIGIBLE	Model / Type Airplane <input type="checkbox"/> Helicopter <input checked="" type="checkbox"/> Appliance <input type="checkbox"/> Component <input type="checkbox"/>	Approval No.: SH07-56 Delegation No.: 290M Delegate Name: E. Burgoin Company: AERO Design Ltd.	
LIST OF APPROVED REPORTS AND DATA			
Document Number	Revision	Document Title	Compliance Status
DCL751-1 75101	0 0	Document Control List and all documents referred to therein Quick Release Cargo Basket Installation	As per Compliance Program, CP751, Revision 1
DATA APPROVED BY TRANSPORT CANADA			
ICA751.90 FMS751.91	0 0	Instructions for Continued Airworthiness Flight Manual Supplement	
CERTIFICATION UNDER THE AUTHORITY VESTED IN ME BY THE DEPARTMENT OF TRANSPORT, I HEREBY CERTIFY THAT THE DATA LISTED ABOVE AND ON THE ATTACHED SHEETS NUMBERED Nil HAVE BEEN EXAMINED IN ACCORDANCE WITH ESTABLISHED PROCEDURES AND FOUND TO COMPLY, TO THE BEST OF MY KNOWLEDGE AND BELIEF WITH THE PERTINENT COMPLIANCE REQUIRMENTS. I THEREFORE <input type="checkbox"/> RECOMMEND FOR APPROVAL OF THESE DATA <input checked="" type="checkbox"/> APPROVE THESE DATA  E. Burgoin, DAR 290M			

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.
2013 39th Avenue NE
Calgary, Alberta, T2E 6R7

DATE: 7 September, 2007
REV. No. 1 24 December, 2007

CORRESPONDANCE TO:
(If other than applicant)

MAKE: Bell
MODEL: 205A-1, 212, 412 Series

REGISTRATION: All Applicable
SERIAL No.: All Applicable

NATURE OF WORK: Installation of Side-Mounted External Cargo Basket

MODEL CERTIFICATION BASIS: FAR 29, Amendment 29-2, plus select sections of later amendments (Bell 412 CF basis of certification)
MODIFICATION CERTIFICATION BASIS: FAR 29, Amendment 29-2, plus select sections of later amendments (Bell 412 CF basis of certification)

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.				
Subpart B – Flight					
29.27	2	Centre of Gravity Limits	N/A		No change from Type Approval.
29.29	2	Empty Weight and Corresponding C of G	Data specified on inst'n drawing	X	
29.45	2	Performance - General	Flight Test	X	Flight test in accordance with FTP751.03
29.51	2	Takeoff data: General	Flight Test	X	
29.63	2	Takeoff: Category B	Flight Test	X	
29.65	2	Category B Climb: All Engines Operating	Flight Test	X	
29.71	2	Helicopter Angle of Glide: Category B	Flight Test	X	
29.73(b)	2	Performance at Min. Operating Speed	Flight Test	x	
29.75	2	Landing	Flight Test	X	
29.141	2	Flight Characteristics – General	Flight Test	X	
29.143	2	Controllability and Maneuverability	Flight Test	X	
29.151	24	Flight Controls	Flight Test	X	
29.161	24	Trim Control	Flight Test	X	
29.171	2	Stability – General	Flight Test	X	
29.173	2	Static Longitudinal Stability	Flight Test	X	
29.175	2	Demonstration of Longitudinal Stability	Flight Test	X	
29.241	2	Ground Resonance	Flight Test	X	
29.251	2	Vibration	Flight Test	X	

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.				
Subpart C – Strength Requirements					
29.301	2	Loads – Air Drag Loads	Analysis	X	
29.301	2	Loads – Inertia Loads	Compliance with 29.337 and 29.561	X	
29.303	2	Factor of Safety	Analysis	X	
29.305	2	Strength and Deformation	Analysis and Test iaw AC 43.13-1B	X	
29.307	2	Proof of Structure	Analysis and Test iaw AC 43.13-1B	X	
29.337(a)	2	Limit Maneuvering Load Factor – Positive	Analysis and Test iaw AC 43.13-1B	X	Critical load factor in downward direction.
29.547	2	Main Rotor Structure	Flight Test	X	
29.561	2	Emergency Landing Conditions	Analysis and Test iaw AC 43.13-1B	X	
29.561(b)3(i)	2	Emergency Landing Conditions – Up	Analysis and Test iaw AC 43.13-1B	X	
29.561(b)3(ii)	2	Emergency Landing Conditions – Fwd	N/A		Forward deflection or failure of basket poses no threat to occupants.
29.561(b)3(iii)	2	Emergency Landing Conditions – Side	Analysis and Test iaw AC 43.13-1B	X	
29.561(b)3(iv)	2	Emergency Landing Conditions – Down	Compliance with 29.337	X	29.337 Maneuvering Load is Critical.
Subpart D – Design and Construction					
29.601	2	Design	Drawings	X	Design is conventional.
29.603	2	Materials	Drawings	X	Materials used are specified in Mil-Hdbk-5J.
29.605	2	Fabrication Methods	Drawings	X	Design is conventional.
29.609	2	Protection of Structure	Drawings	X	
29.611	2	Inspection Provisions	Drawings	X	Design is easy to inspect.
29.613	2	Material Strength Properties and Design Values	Values used as per Mil-Hdbk-5J	X	
29.625	2	Fitting Factor	Analysis	X	
29.783	2	Doors	N/A		Installation does not block doors.
29.787(a)	2	Cargo and Baggage Compartments	Compliance with 23.301 through 307	X	
29.787(b)	2	Cargo and Baggage Compartments	Design	X	Basket is a closed container.
29.787(c)	2	Cargo and Baggage Compartments	N/A		Cargo is external to helicopter.
29.807	2	Emergency Exits	N/A	X	Installation does not block doors.
29.1387	9	Position Light System Dihedral Angles	N/A – statement in report		No change from Type Approval.
29.1401	11	Anticollision Light System	N/A – statement in report		No change from Type Approval.

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.				
Subpart G – Operating Limitations and Information					
29.1505	3	Never Exceed Speed	Flight Test, Flight Manual Supplement	X	V _{NE} limits as specified in the existing Flight Manual
29.1525	2	Kinds of Operation	Flight Manual Supplement	X	Limited to VFR only.
29.1529	2	Maintenance Manual	ICA Provided	X	
29.1557(a)	2	Miscellaneous Markings and Placards – Baggage Compartments	Placard on lid	X	13
29.1557(b)	2	Miscellaneous Markings and Placards	N/A		
29.1557(c)	2	Miscellaneous Markings and Placards	N/A		
29.1557(d)	2	Miscellaneous Markings and Placards	N/A		
29.1581	15	Rotorcraft Flight Manual – General	Flight Manual Supplement	X	
29.1583(c)	2	Operating Limitations – Weight and Loading Information	Flight Manual Supplement	X	
29.1585	2	Operating Procedures	Flight Manual Supplement	X	
29.1587	2	Performance Information	Flight Manual Supplement	X	
29.1589	2	Loading Information	Flight Manual Supplement & Placard	X	Placard installed on basket lid

AERO Design Ltd.

FLIGHT TEST PLAN
FTP751.03

BELL 205A-1

QUICK RELEASE CARGO BASKET

Prepared by: J. Clarke, CET

Approved by: E. Burgoin, P.Eng., DAR 290M

Revision 0, 06 September, 2007

AERO Design Ltd.
Engineering Consultants

2013 – 39th Avenue N.E., Calgary, Alberta T2E 6R7
Phone: (403) 250-8027
Fax: (403) 250-8333
E-Mail: info@aerodesignca

Notice: This report contains information and data which is proprietary to AERO DESIGN LTD. This report, or any portion thereof, may not be reproduced, copied, duplicated or used without the written consent of AERO DESIGN LTD.

TABLE OF CONTENTS

1.0	INTRODUCTION	3
2.0	REFERENCE TEXT	3
3.0	FLIGHT TEST OBJECTIVE	3
4.0	TEST PREPARATION	4
4.1	Instrument Calibration	4
4.2	Equipment	4
4.3	Flight Test Crew	4
4.4	Documents	4
4.5	Weight and Balance	4
5.0	FLIGHT TESTS	5

1.0 INTRODUCTION

The Quick Release Cargo Basket is mounted on the right side of the helicopter. The basket is made from steel tubing and expanded steel mesh. It is quickly detachable from the mounting beams that supports it. The beams fasten to the existing helicopter hard points provided by Bell.

2.0 REFERENCE TEXT

AERO Design Ltd. Installation Drawing 75101,
AERO Design Ltd. Flight Manual Supplement FMS751.91,
Bell 205A-1 Rotorcraft Flight Manual.

3.0 FLIGHT TEST OBJECTIVE

Flight testing of the Quick Release Cargo Basket is meant to demonstrate that the installation does not produce undesirable effects to the handling and performance qualities of the helicopter.

4.0 TEST PREPARATION

4.1 Instrument Calibration

The maintenance records of the test helicopter will be checked to ensure the airspeed indicator has been calibrated within the specified time period.

4.2 Equipment

The helicopter will be fitted with the Quick Release Cargo Basket installation in accordance with drawing 75101.

4.3 Flight Test Crew

Two or three crew members will be required for the test:

- 1) Pilot with training and experience appropriate to the task of testing this equipment.
- 2) Test observer, either a DAR or a qualified alternate appointed by him, beside the pilot.
- 3) (Optional) Test observer, appointed by the DAR, seated in the aft cabin to observe the basket.

All members of the crew will be equipped to communicate via intercom.

Seating arrangement of the observer(s) may be limited by loading requirements.

4.4 Documents

These test flights require a FLIGHT PERMIT issued by Transport Canada.

The draft Flight Manual Supplement shall be on board the aircraft.

The Pilot will familiarize himself with the contents of this Test Plan and the Flight Manual Supplement prior to flight.

4.5 Weight and Balance

The helicopter will be loaded with sufficient fuel and ballast to produce the following conditions for flight:

- A) 7500 lb GW, CG within limits specified in basic flight manual,
- B) 7500 lb GW, same CG as in flight above, with Cargo Basket Installed

Loading information specific to the Quick Release Cargo Basket is contained in the Flight Manual Supplement, FMS751.91. The Cargo Basket will be loaded to the placarded maximum (300 lbs).

For each case, all ballast in the cabin will be properly secured with cargo nets and/or tie-down straps.

5.0 FLIGHT TESTS

One flight is required for each of the conditions listed in 4.5 above.

- 1 - Baseline flight, 7500 lbs GW, CG within basic Flight Manual limitations.
- 2 - Flight with cargo basket, 7500 GW, same CG location as baseline flight.

The flights will follow approximately identical profiles:

- a) Hover in ground effect. Translate forward, aft, and to each side. Keep pedals neutral and measure cyclic stick position for each motion. If a ground wind exists, attempt to maintain position in the hover in various orientations relative to the wind.
- b) Climb with forward speed of 60 KIAS, using approximately 90% power (use the same power setting for subsequent flights). Measure climb rate by timing the ascent between two altitudes. Measure cyclic stick position while climbing straight ahead, 30 degree bank right and 30 degree bank left.
- c) Level off and establish cruise speed of approximately 70% power. Note the engine torque, exact airspeed and altitude maintained, and cyclic stick position. Bank 30 degrees and measure cyclic stick position again. Repeat for opposite direction. Maintain neutral pedal pressure during turns.
- d) Repeat cruise speed test at increasing power (80%). Repeat with Maximum Continuous Power applied. Note all data for each speed.
- d) V_{NE} of the un-modified helicopter is sought for the modification. Descend at full throttle until V_D ($V_{NE}/0.9$) is reached. Continue to descend straight, then turn gently to the left and right. Reduce power and recover.
 $V_{NE} = 120 \text{ KIAS @ } 7500 \text{ lbs GW}$
 $V_D = 120 \text{ KIAS} / 0.9 = 133.3 \text{ KIAS @ } 7500 \text{ lbs GW}$
Decrease V_{NE} and V_D by 3 kts per 1000 ft above 3000 ft H_D
- f) From cruise attitude at 100 KIAS, enter autorotating descent, recovering after descending 1000 ft. During descent, turn gently to the left and right. Repeat with entry speed 60 KIAS.
- g) Approach and land normally. If a ground wind is present, land cross-wind.

The pilot shall report to the observer any satisfactory or not satisfactory handling and controllability characteristics for each phase of the flight.

BASKET INSTALLED: (Y / N) TAKE-OFF WEIGHT: _____ C.G.: _____		CYCLIC POSITION			RESULTS	
Test Phase	Test Procedure	DIRECTION	X	Y		OK
HOVER	Translate slowly FORWARD 20 KIAS	STRAIGHT				
HOVER	Translate slowly AFT 10 KIAS	STRAIGHT				
HOVER	Translate slowly RIGHT 20 KIAS	RIGHT				
HOVER	Translate slowly LEFT 20 KIAS	LEFT				
CLIMB	Apply ~90% Torque Forward speed 60 KIAS Neutral pedal input	STRAIGHT RIGHT LEFT			Engine Torque: _____ Start Time: _____ Altitude: _____ Stop Time: _____ Altitude: _____	
CRUISE	70% Torque Maintain constant altitude for > 30 seconds.	STRAIGHT RIGHT LEFT			Engine Torque: _____ Altitude: _____ Speed Attained: _____	
CRUISE	80% Torque Maintain constant altitude for > 30 seconds.	STRAIGHT RIGHT LEFT			Engine Torque: _____ Altitude: _____ Speed Attained: _____	
CRUISE	Apply Maximum Continuous Power Maintain constant altitude for > 30 seconds.	STRAIGHT RIGHT LEFT			Engine Torque: _____ Altitude: _____ Speed Attained: _____	
DEMON- STRATION SPEED	Descend & apply power as required V _D 133.3 KIAS	STRAIGHT RIGHT LEFT			Engine Torque: _____ Speed Attained: _____	
AUTOROTATE	Entry speed 100 KIAS	STRAIGHT			Entry Altitude: _____	

BASKET INSTALLED: (Y / N)		CYCLIC POSITION			RESULTS	
TAKE-OFF WEIGHT: _____ C.G.: _____						
Test Phase	Test Procedure	DIRECTION	X	Y		OK
AUTOROTATE	Entry speed 60 KIAS	STRAIGHT			Entry Altitude: _____	
HANDLING	NOTE ANY COMMENTS OR OBSERVATIONS					

GROUND TEST MEASUREMENTS (AT FLIGHT TEST WEIGHT):

Clearance from ground up to helicopter belly: _____

Clearance from ground up to bottom of cargo basket: _____

Clearance from ground up to bottom of cargo hook: _____

The test described above has been performed in accordance with the applicable standards of airworthiness.		
Signed:	Date:	Aircraft Make/Model:
Approval #:		Aircraft Serial No./Registration:



Transport
Canada

Transports
Canada

FLIGHT AUTHORIZATION

AUTORISATION DE VOL

To: - GUARDIAN HELICOPTERS
SPRINGBANK ALBERTA

Nationality and Registration Marks Marques de nationalité et d'immatriculation	Aircraft Manufacturer and Model Constructeur et modèle de l'aéronef	Aircraft Serial Number Numéro de série de l'aéronef	Category - Catégorie
C-FTGK	BELL 205	30009	

THIS CONSTITUTES:
LA PRÉSENTE CONSTITUE:

☐ A CERTIFICATE OF AIRWORTHINESS
UN CERTIFICAT DE NAVIGABILITÉ

☐ STANDARD

In respect of Part II of Annex 16 (aircraft noise) to the Convention of International Aviation and Aeronautics Act, this aircraft:

En vertu de la Partie II de l'Annexe 16 (bruit des aéronefs) de la Convention relative à l'Aviation civile internationale et de la Loi sur l'aéronautique, l'aéronef mentionné

☐ complies with the requirements
satisfait aux exigences

☐ does not comply with the requirements
ne satisfait pas aux exigences

☐ is not required to comply
n'est pas obligé de satisfaire aux exigences

☐ SPECIAL - SPÉCIAL

☐ Provisional - Provisoire

☐ Restricted - Restreint

☐ Amateur-Built - Construction amateur

☐ Limited - Limité

This document is subject to special compulsory conditions of issue (operating limitations) specified on the reverse side of this document.

Le présent document est assujéti aux conditions de délivrance obligatoires et spéciales (limites d'utilisation) stipulées au verso.

Indicate Numbers - Inscrire les numéros

THIS CONSTITUTES:
LA PRÉSENTE CONSTITUE:

☒ A FLIGHT PERMIT
UN PERMIS DE VOL

☐ EXPERIMENTAL - EXPÉRIMENTAL

☐ SPECIFIC PURPOSE - FIN SPÉCIFIQUE

☐ Ferry Flight
Vol de convoyage

☐ Demonstration, market survey or crew training
Vol de démonstration, étude de marché ou formation d'équipage

☒ Test purposes following repair, modification or maintenance
Vol d'essai à la suite de réparation, modification ou maintenance

☐ Importation or exportation flight
Vol pour fin d'importation ou d'exportation

☐ Other (Specify)
Autre (Préciser)

Flight from - Vol de

To - À

To - À

WITHIN VICINITY OF SPRINGBANK - AUTHORIZED TO (UNE/0.?)

This document is subject to special compulsory conditions of issue (operating limitations) specified on the reverse side of this document.

Le présent document est assujéti aux conditions de délivrance obligatoires et spéciales (limites d'utilisation) stipulées au verso.

Indicate Numbers - Inscrire les numéros

8, 13, 16

FLIGHT TESTS PER AERC DESIGN FLIGHT TEST PLAN FTA 751.03 Rev D

This document is valid for the number of days indicated on the right, following the date of issue. Where pertinent, a replacement flight permit or a certificate of airworthiness will be issued to you.

Le présent document reste valide pendant le nombre de jours indiqués à droite qui suivent la date de délivrance. S'il y a lieu, un permis de vol ou un certificat de navigabilité de remplacement vous sera délivré.

Days - Jours

90

For the Minister of Transport - Pour le ministre des Transports

Date of Issue
Date de délivrance

Regional Office - Bureau régional

Nov 29, 2007 P.N.R. Calgary

Fee paid - Montant versé

\$

☐ Cash
Comptant

☐ Cheque
Chèque

Jeff Clarke

From: Jeff Clarke [jeff@aerodesign.ca]
Sent: Wednesday, December 19, 2007 1:34 PM
To: 'Staal, Jack'
Subject: RE: Bell 205A-1 Cargo Basket
Attachments: ICA751.90_0a.pdf; FMS751.91_0a.pdf; 75101_0a.pdf

Jack,

Please find attached the FMS with the changes Michel requested.

I have also changed the ICA and installation drawing to allow for installation on either side. Michel noted that the configuration flown in the test was critical because the basket was on the same side as the tail rotor, and the helicopter was fitted with an aux. fuel tank on the right side. Guardian requested the option of either side because they may have an aux fuel tank installed on either side, and would prefer to have the basket on the opposite side for a more favourable weight and balance.

Please note that I have updated the eligible models in NDWL to include the 205A-1 / 205B / 212 / 412 / 412EP / 412CF. The only model that was in NDWL when I added these was 205A, which I don't believe there are many around that haven't been converted to 205A-1. Michel's test report recommends for approval on all of these models, and is what we are looking for on the STC.

I think that is all of the paper work from our end. Let me know if you require anything further.

Are you taking some time off for the holidays?

Merry Christmas!

Jeff

12/19/2007

BELL 205A-1 / 212 / 412

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the **INSTALLATION of the AERO DESIGN** **QUICK RELEASE CARGO BASKET**

Supplemental Type Certificate No. SH07-56

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 205A-1 / 212 / 412 when fitted with the Quick Release Cargo Basket Installation. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.

Table of Contents

I	Limitations	3
II	Normal Procedures	3
III	Emergency Procedures	3
IV	Performance	3
V	Weight and Balance	4
VI	Installation / removal instructions	6

Record of Revisions

Revision	Issue Date	Pages Revised	Date Inserted	By
0	07 Sept, 2007	None		

I LIMITATIONS

1. The maximum load in the AERO Design Ltd. Quick Release Cargo Basket is 300 lb. (135.7 kg).
2. Only one basket may be installed on the helicopter, on the right or left side.
3. Flight operations limited to VFR conditions with AERO Design Ltd. Quick Release Cargo Basket installed.
4. V_{NE} is unchanged from the basic rotorcraft.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all cargo stored in the cargo basket is properly tied down and secured for flight.
 - b) Ensure that the lid of cargo basket is closed and secured.
 - c) Ensure the basket is locked in position on the beams. Pull up on the forward and aft end of the basket to check.

CAUTION

It is possible to exceed the lateral centre of gravity limits of the rotorcraft under some loading conditions. Pilots must ensure that lateral C of G is within limits when loading the basket.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

IV PERFORMANCE

1. Cruise performance and range will be reduced by approximately 10 percent with the Cargo Basket Installed.
2. Climb performance will be reduced by up to 150 fpm.

V WEIGHT AND BALANCE

1. The following weight and balance is for the low mounted quick release cargo basket configuration, installed in accordance with drawing 75101.

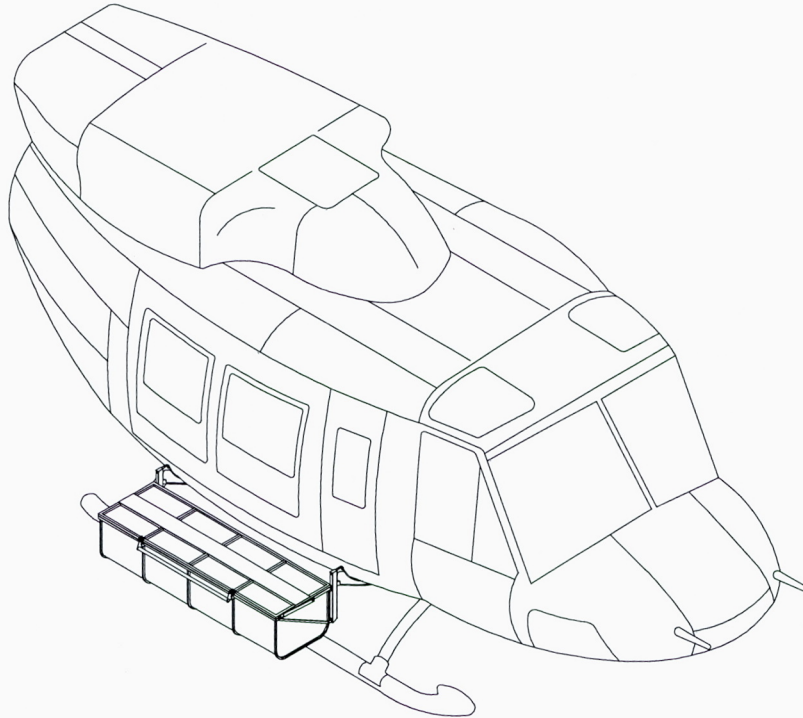


Figure 1 – Quick Release Cargo Basket Configuration

Quick Release Cargo Basket Configuration

Item	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
Cargo Basket Only ¹	49.5 lb	119.5 in	5 915 in*lb	+/- 62.2 in	+/- 3 079 in*lb
	22.4 kg	3035 mm	67 979 mm*kg	+/- 1580 mm	+/- 35 389 mm*kg
Cargo ² (MAX)	300 lb	119.5 in	35 850 in*lb	+/- 62.2 in	+/- 18 660 in*lb
	135.7 kg	3035 mm	411 991 mm*kg	+/- 1580 mm	+/- 214 480 mm*kg

¹ Weight and balance is for Cargo Basket only. Mounting beams are not included since they should have been included in the basic rotorcraft weight and balance at time of initial installation.

² Longitudinal and Lateral moment arms are given only for the center of the Cargo Basket. Due to the length of the basket, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations.

VI INSTALLATION / REMOVAL INSTRUCTIONS

The basket and beams are installed in accordance with drawing 75101. Removal of the basket leaving the beams in place is an approved configuration for flight. Logbook entry indicating installation or removal of basket and which weight and balance amendment is in effect is required when basket is installed or removed.

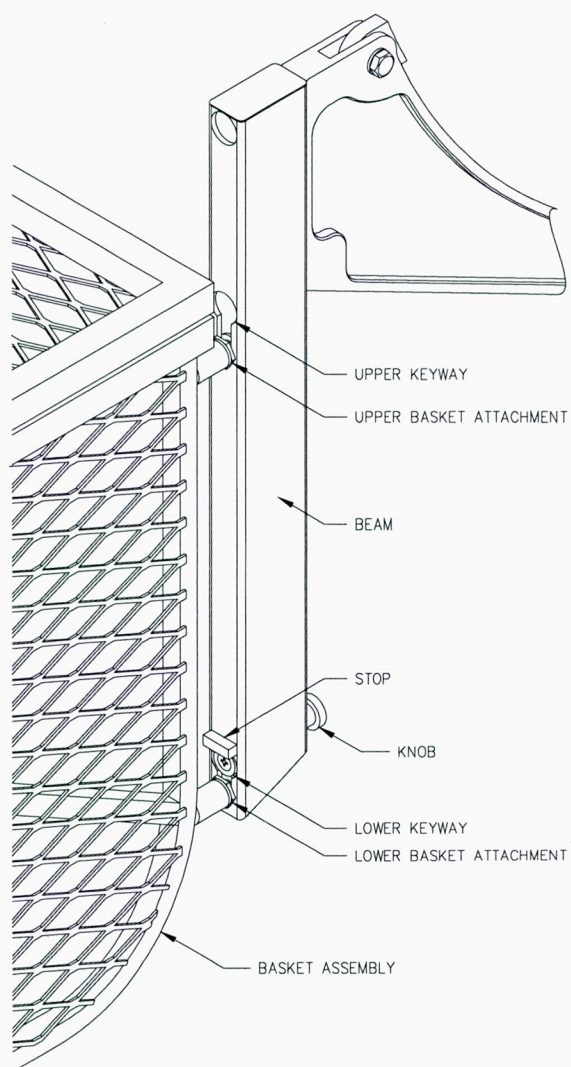


Figure 2 – Basket Attachment

1. Installation - Refer to Figure 2.
 1. Set basket upper attachment into keyway on forward and aft beams.
 2. At forward end of basket, lift until lower attachment fitting hits stop over keyway. Push fitting into keyway and slide basket down until locked. Repeat for aft end.
2. Removal - Refer to Figure 2.
 1. Pull knob at bottom end of forward beam and lift basket until lower attachment fitting is free of keyway. Keep upper basket attachment in keyway in beam. Repeat for aft end.
 2. Lift basket until upper attachments are out of keyways in beams and remove basket from helicopter.

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA 751.90

QUICK RELEASE CARGO BASKET

Preface

These Instructions for Continued Airworthiness shall be included in the rotorcraft Maintenance Manual when the Quick Release Cargo Basket assembled in accordance with AERO Design Ltd. Document Control List DCL751-2, Revision 0, and DCL751-3, Revision 0, or later approved revision, is installed.

The information contained herein supplements the information in the basic Maintenance Manual. For Maintenance practices and procedures not contained in these Instructions for Continued Airworthiness refer to the basic Maintenance Manual and its approved supplements.

Revision 0
Date: 6 September, 2007

AERO Design Ltd.
Engineering Consultants

2013 – 39th Avenue N.E., Calgary, Alberta T2E 6R7
Phone: (403) 250-8027
Fax: (403) 250-8333
E-Mail: infor@aerodesign.ca

Notice: This report contains information and data which is proprietary to AERO Design Ltd. This report, or any portion thereof, may not be reproduced, copied, duplicated or used without the written consent of AERO Design Ltd.

RECORD OF REVISIONS

Revision Number	Issue Date	Date Inserted	By
0			Original Issue

LIST OF EFFECTIVE PAGES

List of Revisions

Revision 0 (Original Issue) 6 September, 2007

List of Effective Pages

<u>Description</u>	<u>Pages</u>	<u>Revision No.</u>
Cover	1	0
Revision Record/List of Effective Pages	2	0
Table of Contents	3	0
00-00-00	4-5	0
04-00-00	6	0
05-00-00	7-9	0
11-00-00	10	0
25-50-00	11-13	0

TABLE OF CONTENTS

RECORD OF REVISIONS	2
LIST OF EFFECTIVE PAGES	2
CHAPTER 0 – INTRODUCTION	4
0-1 SCOPE	4
0-2 DEFINITIONS AND ABBREVIATIONS	4
0-3 DISTRIBUTION	4
0-4 COMPATIBILITY	4
0-5 GENERAL DESCRIPTION	5
CHAPTER 4 - AIRWORTHINESS LIMITATIONS	6
CHAPTER 5 – INSPECTION REQUIREMENTS	7
5-1 INSPECTION SCHEDULE	7
5-2 DAMAGE LIMITS / REPAIR INSTRUCTIONS	8
5-3 PROTECTIVE TREATMENT INFORMATION	9
CHAPTER 11 – MARKINGS AND PLACARDS	10
CHAPTER 25 – EQUIPMENT AND FURNISHINGS	11
SECTION 50 – CARGO COMPARTMENTS	11
25-1 BEAMS INSTALLATION	11
25-2 BEAMS REMOVAL	12
25-3 BASKET INSTALLATION	12
25-4 BASKET REMOVAL	13
25-5 WEIGHT AND BALANCE	13
25-6 STRUCTURAL FASTENER DATA	13

CHAPTER 0 – INTRODUCTION

0-1 SCOPE

The following Instructions for Continued Airworthiness (ICA) satisfy the requirements of 14 CFR 29.1529, and provide the information necessary to complete the on-going maintenance and inspections required for rotorcraft embodying the Quick Release Cargo Basket as described herein.

0-2 DEFINITIONS AND ABBREVIATIONS

ICA - Instructions for Continued Airworthiness

LH - Left Hand

RH - Right Hand

0-3 DISTRIBUTION

Copies of this ICA and amendments shall be distributed to all known purchasers of the Quick Release Cargo Basket. Requests for a copy may be made in writing to:

AERO Design Ltd.
2013 39th Avenue N.E.
Calgary, Alberta
T2E 6R7
Fax: 403-250-8333
Email: info@aerodesign.ca

Any changes will be sent to Transport Canada. All changes will be recorded in the Record of Revisions page at the front of this document.

0-4 COMPATIBILITY

Prior to incorporating this modification, the installer shall establish that the inter-relationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the helicopter.

0-5 GENERAL DESCRIPTION

The cargo basket installation is a metal mesh basket installed to the side of the helicopter on beams attached to existing hard points under the main cabin door. The quick release basket allows for the installation and removal of the basket without tools, allowing a pilot operating in the field without maintenance support to install or remove the basket, leaving the mounting beams in place.

The basket itself is 72" long, 22.5" wide, and 17" high. It is made of a steel welded tubing structure, and lined with expanded steel mesh. The basket has a hinged lid with a self-locking handle.

The beams consist of a machined aluminum section to attach to the hard points, with a steel tube bolted to the outboard face. The quick release mechanism is built into the steel tube.

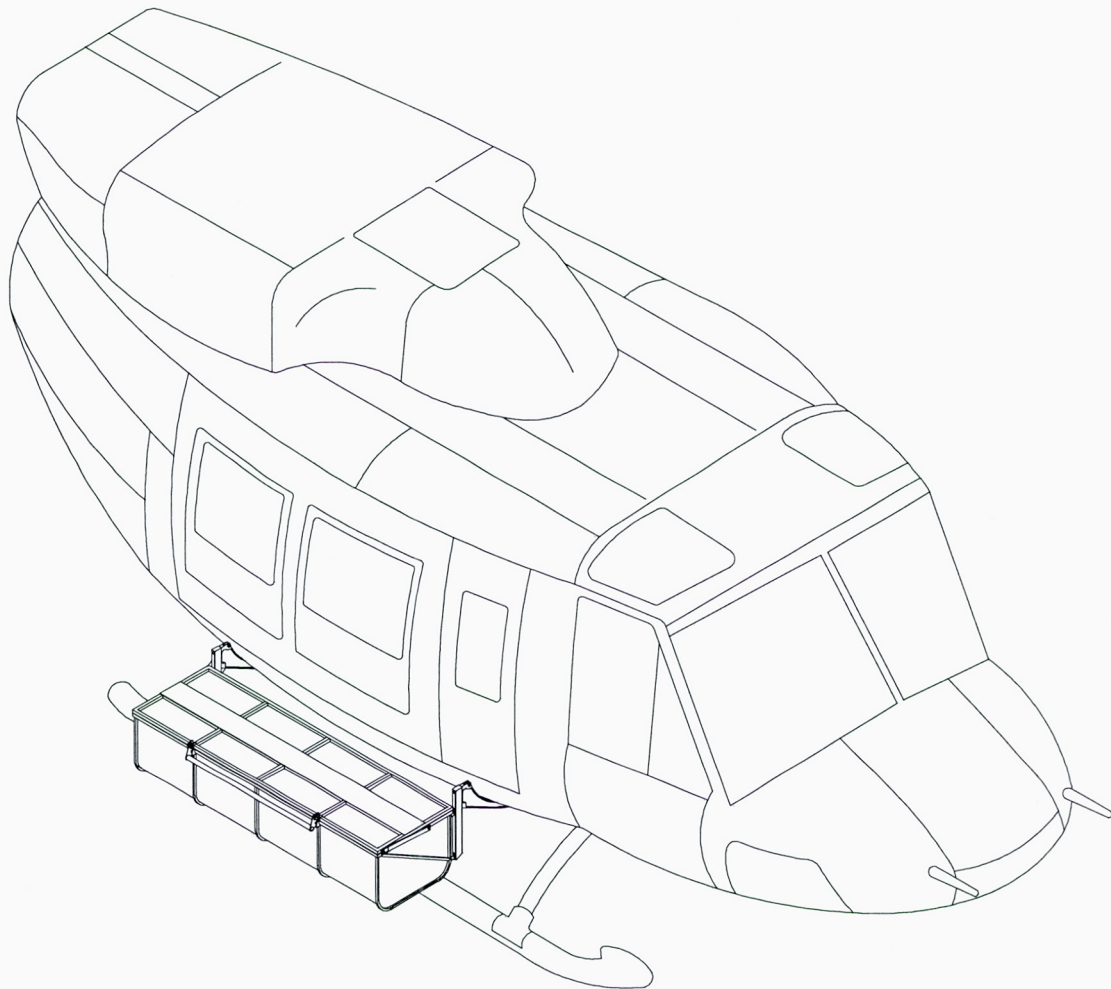


Figure 1 – Cargo Basket Installation

CHAPTER 4 - AIRWORTHINESS LIMITATIONS

The Airworthiness Limitations section is Transport Canada-approved and specifies maintenance required under Section 571 of the Canadian Aviation Regulations, unless an alternative program has been approved.

No additional airworthiness limitations have been imposed due the installation of the Quick Release Cargo Basket.

CHAPTER 5 – INSPECTION REQUIREMENTS

5-1 INSPECTION SCHEDULE

Continued airworthiness is contingent upon compliance with the following inspection items. These items shall be completed in conjunction with the rotorcraft Maintenance Inspection schedule, or other approved program, or upon removal and replacement of any component of Quick Release Cargo Basket.

Daily Inspection

1. Inspection Area: Basket
 - a) Inspect the basket attachment to the beams for condition and security. Ensure quick release mechanism is completely extended, flush with the outboard surface of the beam.
 - b) Inspect latching of the lid for correct operation. If basket is bent inward the lid will close but may not latch.

300 Hour or Annual Inspection

1. Inspection Area: Basket
 - a) Visually inspect tube-to-tube welds and mesh-to-tube welds for cracks, corrosion or other damage.
 - b) Visually inspect basket mesh for damage.
2. Inspection Area: Beams

With the basket removed:

 - a) Visually inspect beams attaching basket to the helicopter for cracks, corrosion or other damage.
 - b) Visually inspect the AN5 bolts attaching the steel tube to aluminum beam for condition and security.
 - c) Visually inspect lugs attaching the basket to the beams for security and damage.
 - d) Visually inspect bolts attaching beams to helicopter hard points for condition and security.

Special Inspections

Following a hard landing inspect the Quick Release Cargo Basket installation in accordance with the 300 hour or annual inspection listed above.

5-2 DAMAGE LIMITS / REPAIR INSTRUCTIONS

If damage is found in the inspections above, repair in accordance with the instructions below.

1. Basket

- a) Repair Basket in accordance with AC43.13-1B, Chapter 4, Section 5, Welding, as required.
- b) Basket is fabricated from the following materials:
 - Lid and Rim: $\frac{3}{4}$ " square steel tube
 - Frames: $\frac{1}{2}$ " square steel tube
 - Mesh: $\frac{3}{4}$ " 16 ga. (0.040") expanded steel mesh
- c) Touch up with polyurethane paint as required following repairs.

2. Steel Beams

DO NOT REPAIR DAMAGE TO BEAMS IF BEYOND THE LIMITS BELOW.

- a) Nicks and/or gouges on the outboard face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour.
- b) Nicks and/or gouges on the side and inboard faces up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- c) Critical keyway dimensions are shown in Figure 3. Attempt to insert 27/64 drill shank into bottom end of keyway. If drill can be inserted, slot is worn beyond limit.



Figure 3 – Keyway dimensions

- d) Touch up with polyurethane paint as required following repairs.

3. Aluminum Beams

DO NOT REPAIR DAMAGE TO BEAMS IF BEYOND THE LIMITS BELOW.

- a) Nicks and/or gouges on the top or bottom face up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- b) Nicks and/or gouges on the flanges up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- c) Nicks and/or gouges on the web up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour.
- d) Touch up with polyurethane paint as required following repairs.

5-3 PROTECTIVE TREATMENT INFORMATION

1. Beams

The steel tube is supplied powder coated white, the aluminum beam is painted white. If the powder coat or paint is damaged, touch up with white polyurethane paint.

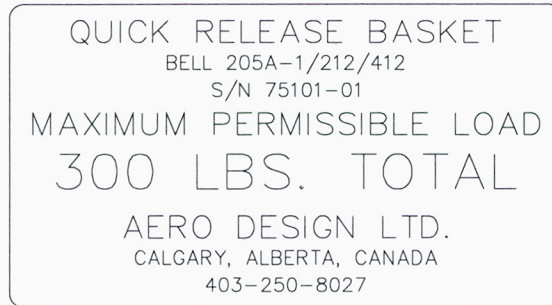
2. Cargo Basket

The cargo basket is supplied powder coated white. If the powder coat is damaged, touch up with white polyurethane paint.

CHAPTER 11 – MARKINGS AND PLACARDS

The following markings and placards are used with the Quick Release Cargo Basket Installation in the locations noted:

- a) Located on basket lid:



CHAPTER 25 – EQUIPMENT AND FURNISHINGS

SECTION 50 – CARGO COMPARTMENTS

The Quick Release Cargo Basket Installation may be applied to the right or left side of the helicopter. The Beams may be installed on both the right and left sides if required. A Cargo Basket may only be installed on the right or left side, not both.

25-1 BEAMS INSTALLATION

Refer to Figure 4.

1. Ensure hard points at FS 84.46 and FS155.11 are fitted with bushings, in accordance with the original configuration of the helicopter. Bushings must be pressed flush with the surface of the lug.
2. Locate 75115-01 Forward Beam Assembly on hard points at FS 84.45. Install two AN5-12A Bolts, AN960-516 Washers (2 per bolt) and MS21044N5 nuts. Torque AN5 bolts to 100-140 in-lbs.
3. Locate 75116-01 Aft Beam Assembly on hard points at FS 155.11. Install two AN4-12A Bolts, AN960-416 Washers (2 per bolt), and MS21044N4 Nuts. Torque AN4 bolts to 50-70 in-lbs.

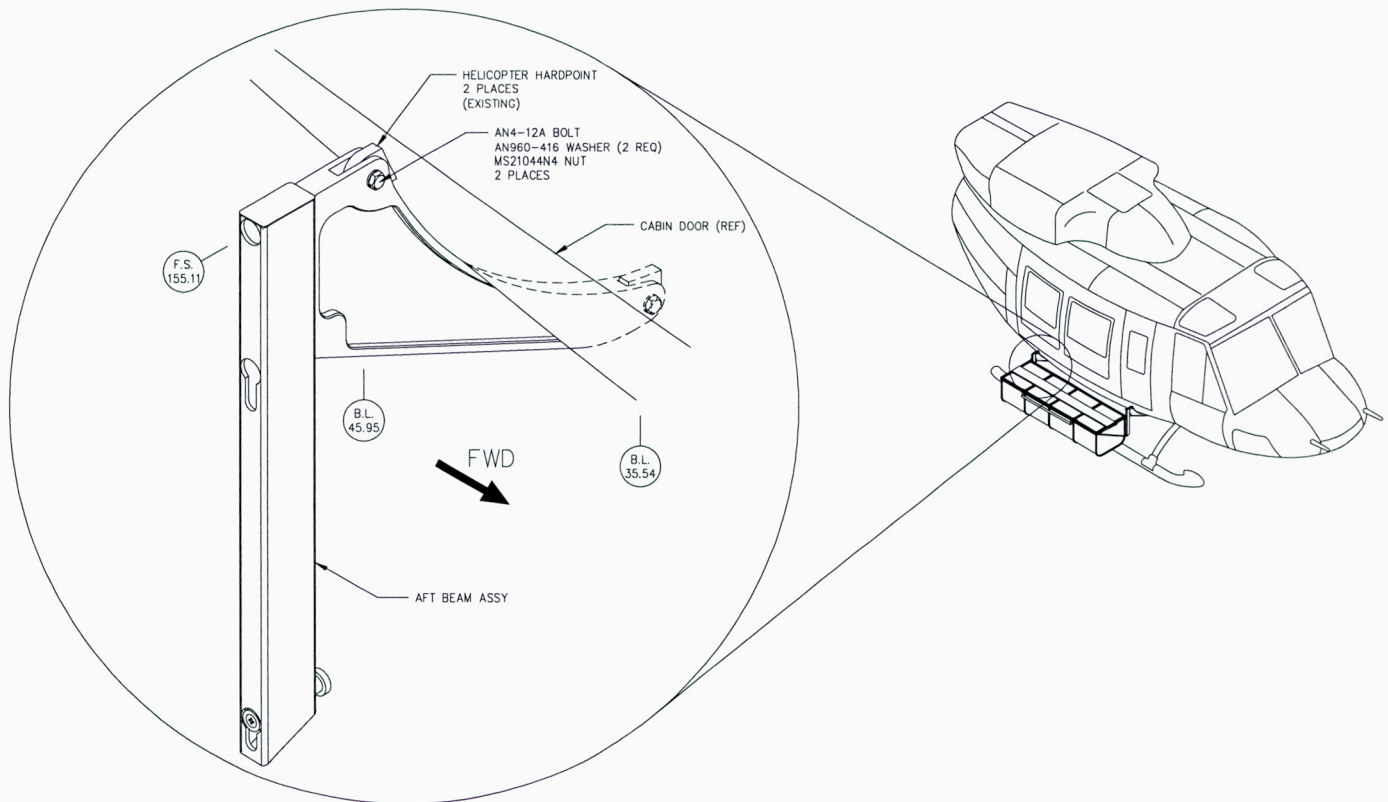


Figure 4 – Beam Installation
(Right side shown, left side similar)

25-2 BEAMS REMOVAL

Refer to Figure 4.

1. Remove Cargo Basket. Refer to section 25-4.
2. Remove two AN5-12A Bolts, AN960-516 Washers and MS21044N5 Nuts from 75115-01 Forward Beam Assembly. Remove Forward Beam.
3. Remove two AN4-12A Bolts, AN960-616 Washers and MS21044N4 Nuts from 75116-01 Aft Beam Assembly. Remove Aft Beam.

25-3 BASKET INSTALLATION

Refer to Figure 5.

1. Set basket upper attachment into upper keyway in forward and aft beams.
2. At forward end of basket, lift basket until lower attachment fitting hits stop. Push fitting into keyway and slide basket down until locked.
3. Repeat step 2 for aft end.

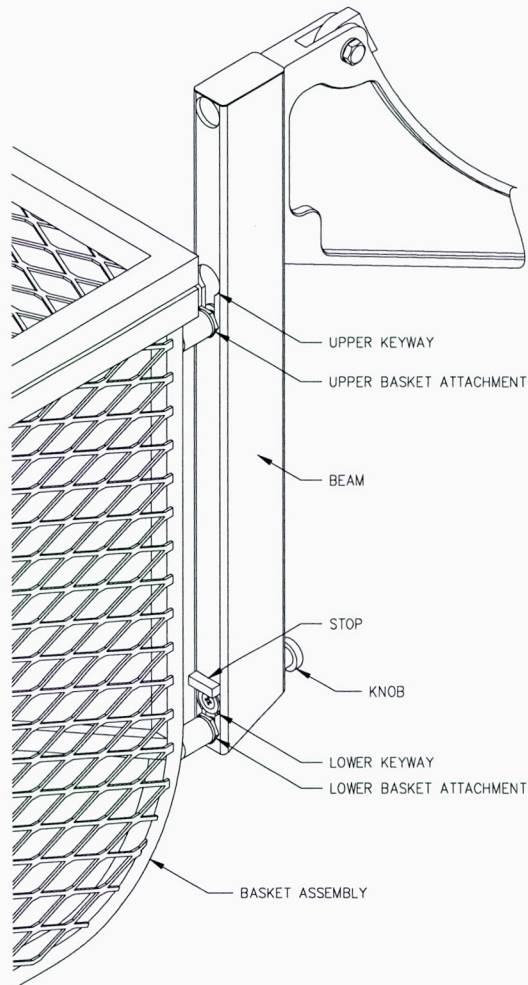


Figure 5 – Basket Attachment

25-4 BASKET REMOVAL

Refer to Figure 5.

1. Pull knob at bottom end of forward beam and lift basket until lower attachment fitting is free of keyway. Keep upper basket attachment in keyway on beam.
2. Pull knob at bottom end of aft beam and lift basket until lower attachment fitting is free of keyway. Keep upper basket attachment in keyway on beam.
3. Lift basket until upper attachments are out of keyways on both beams and remove basket from helicopter.

25-5 WEIGHT AND BALANCE

Two weight and balance configurations are required for the pilot. The first is the installation of Beams only. The second is Cargo Basket and Beams as the basket may be removed/installed in the field by the pilot.

Configuration 1 – Beams Only		Weight (lbs)	Longitudinal		Lateral	
Part #	Name		Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
75115-01	Forward Beam Assembly	5.0	84.5	422.5	46.0	230.0
75116-01	Aft Beam Assembly	4.6	155.1	713.5	47.3	217.6
Total		9.6	118.3	1136.0	46.6	447.6

Configuration 2 – Basket and Beams		Weight (lbs)	Longitudinal		Lateral	
Part #	Name		Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
75115-01	Forward Beam Assembly	5.0	84.5	422.5	46.0	230.0
75116-01	Aft Beam Assembly	4.6	155.1	713.5	47.3	217.6
75110-01	Cargo Basket	49.5	119.5	5915.3	62.2	3078.9
Total		59.1	119.3	7051.3	59.7	3526.5

Note: Lateral arms are given for right side installation. For installation on left side, lateral arms are negative.

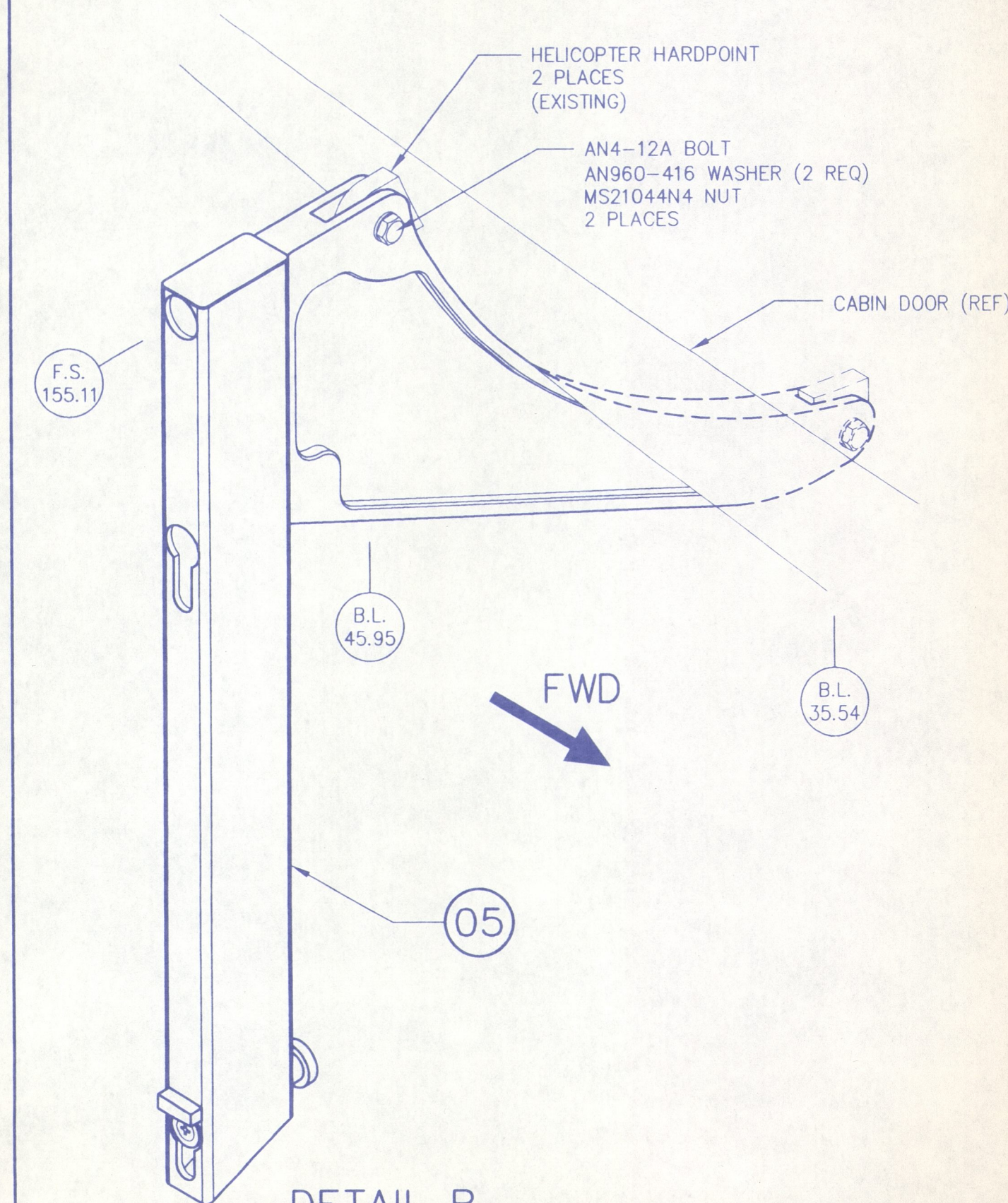
25-6 STRUCTURAL FASTENER DATA

Refer to Bell Standard Practices Manual BHT-ALL-SPM for torque values not listed in this ICA.

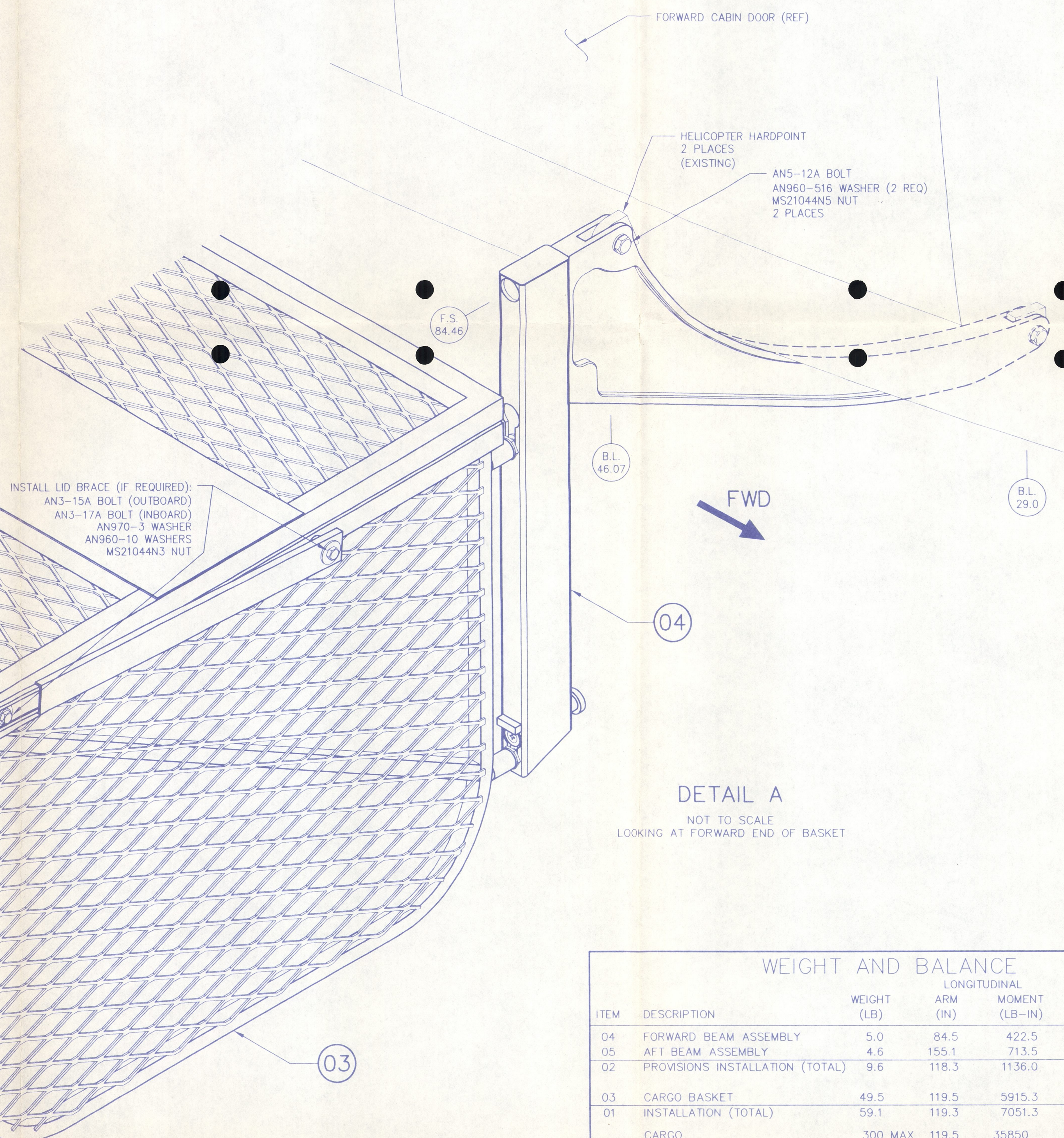
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		

NOTES

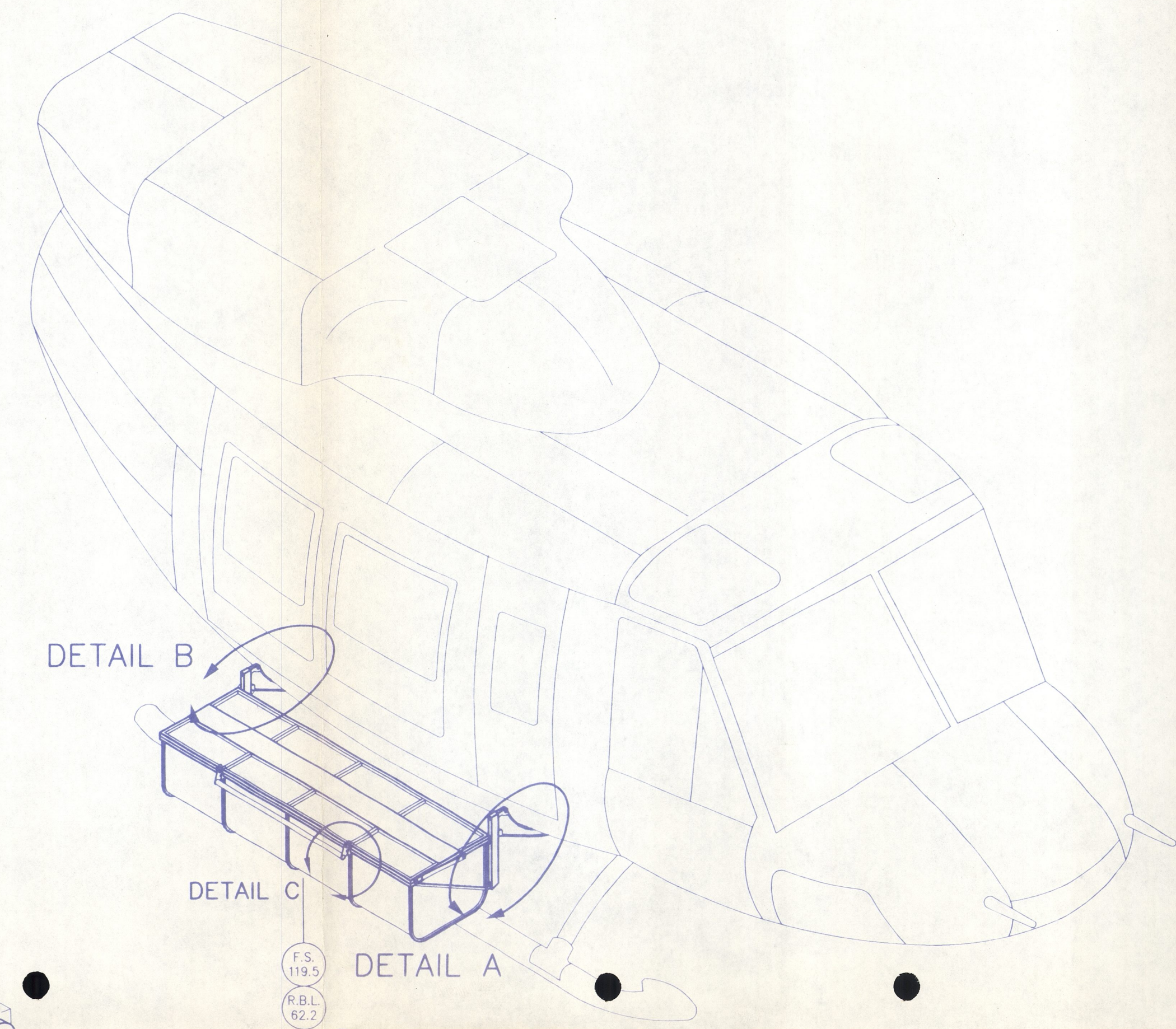
1. HIGH SKID GEAR INSTALLATION IS A MANDATORY PREREQUISITE FOR THIS INSTALLATION.
2. THE HELICOPTER HARD POINTS ORIGINALLY HAVE BUSHINGS INSTALLED. HARD POINTS MUST HAVE THESE BUSHINGS INSTALLED AND PRESSED FLUSH PRIOR TO INSTALLATION OF THE QUICK RELEASE CARGO BASKET PROVISIONS.
3. PROVISIONS INSTALLATION (75101-02) MAY REMAIN INSTALLED WITH THE BASKET REMOVED.
4. REFER TO FLIGHT MANUAL SUPPLEMENT, FMS751.91, FOR LIMITATIONS WITH THE QUICK RELEASE CARGO BASKET INSTALLED.
5. REFER TO INSTRUCTIONS FOR CONTINUED AIRWORTHINESS, ICA751.90, FOR MAINTENANCE INFORMATION.
6. REFER TO DRAWING 36255 FOR HANDLE INSTALLATION IF REQUIRED.



DETAIL B
NOT TO SCALE
LOOKING AT AFT BEAM
BASKET NOT SHOWN



DETAIL A
NOT TO SCALE
LOOKING AT FORWARD END OF BASKET



- 01 INSTALLATION
02 PROVISIONS INSTALLATION

BELL 212 SHOWN, BELL 205A-1 AND 412 INSTALLATION IDENTICAL
NOT TO SCALE

Bottom of aft beam to ground 15 1/8

Clearance from door
cabin floor 5"

QTY	QTY	PART NO.	ITEM	DESCRIPTION
2		MS21044N4	NUT	
2		MS21044N5	NUT	
4		AN960-416	WASHER	
4		AN960-516	WASHER	
2		AN4-12A	BOLT	
2		AN5-12A	BOLT	
1		75116-01	05	AFT BEAM ASSEMBLY
1		75115-01	04	FORWARD BEAM ASSEMBLY
1		75110-01	03	BASKET ASSEMBLY
1		75101-02	02	PROVISIONS INSTALLATION
		75101-01	01	INSTALLATION

LIST OF MATERIALS

WEIGHT AND BALANCE						
ITEM	DESCRIPTION	WEIGHT (LB)	LONGITUDINAL		LATERAL	
			ARM (IN)	MOMENT (LB-IN)	ARM (IN)	MOMENT (LB-IN)
04	FORWARD BEAM ASSEMBLY	5.0	84.5	422.5	46.0	230.0
05	AFT BEAM ASSEMBLY	4.6	155.1	713.5	47.3	217.6
02	PROVISIONS INSTALLATION (TOTAL)	9.6	118.3	1136.0	46.6	447.6
03	CARGO BASKET	49.5	119.5	5915.3	62.2	3078.9
01	INSTALLATION (TOTAL)	59.1	119.3	7051.3	59.7	3526.5
	CARGO (POSITIONS GIVEN ARE FOR CENTRE OF BASKET)	300 MAX	119.5	35850	62.2	18660

APPROVALS		DATE
DRAWN:	JEFF CLARKE	05 SEPT 2007
CHECKED:	E. BURGAIN	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:		
DECIMALS	X.XXX ±0.010	ANGLES ±1/2°
X.XX	±0.03	
X.X	±0.1	

AERO DESIGN LTD.

CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M
2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7
tel: (403) 250-8027 fax: (403) 250-8333 www.aerodesign.ca

BELL 205A-1, 212, 412 QUICK RELEASE CARGO BASKET INSTALLATION

NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 1	A1	75101	0

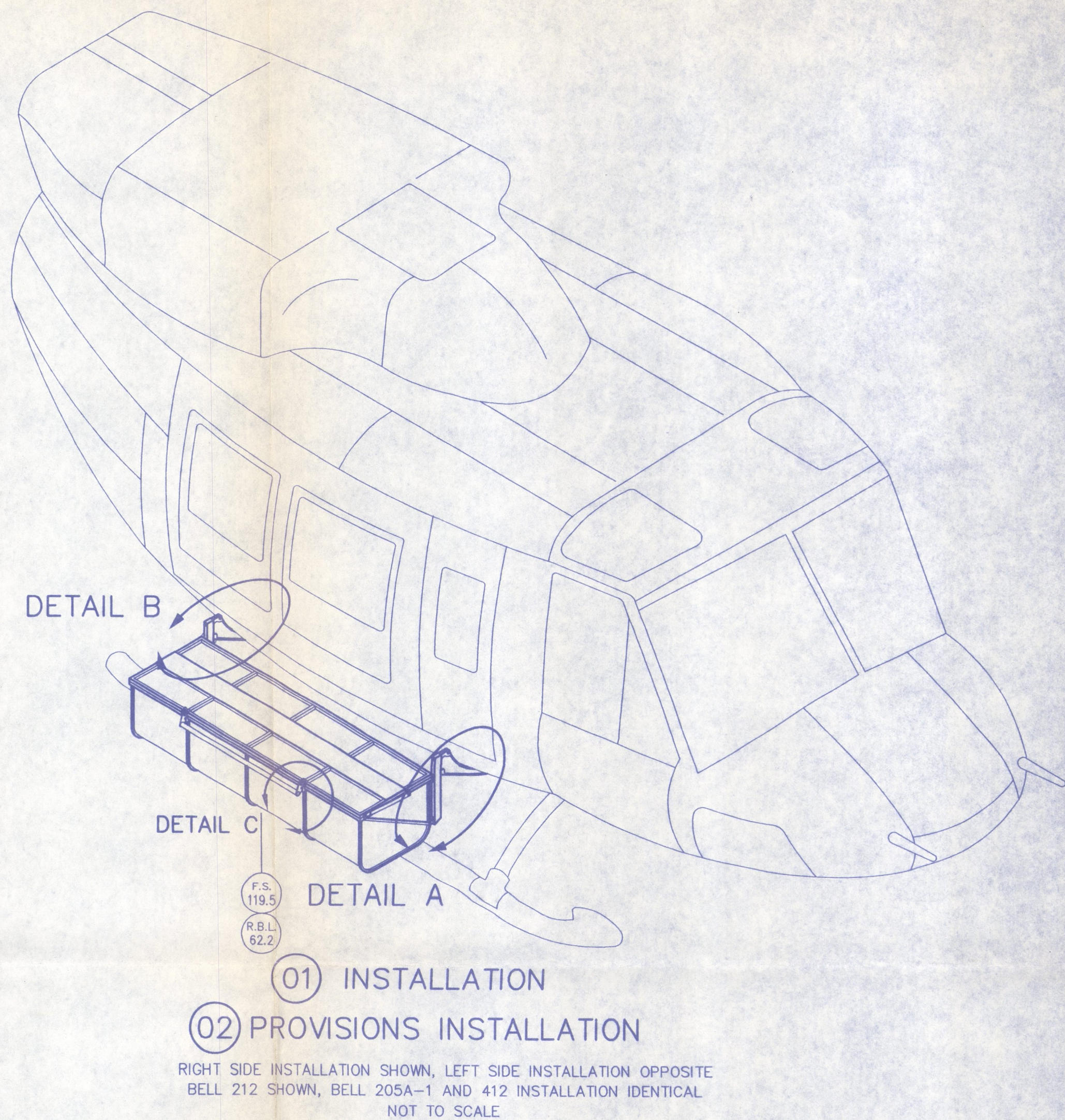
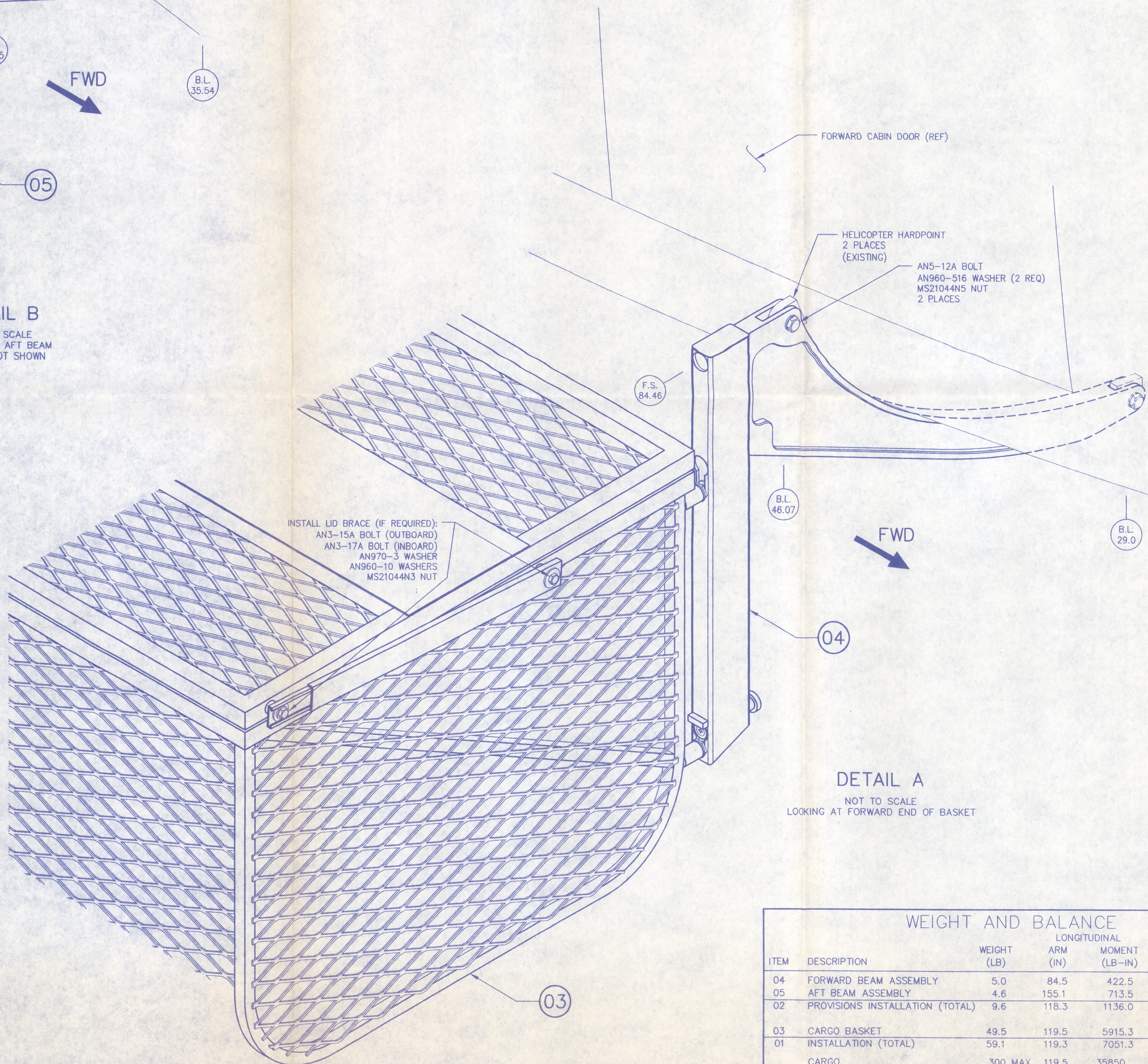
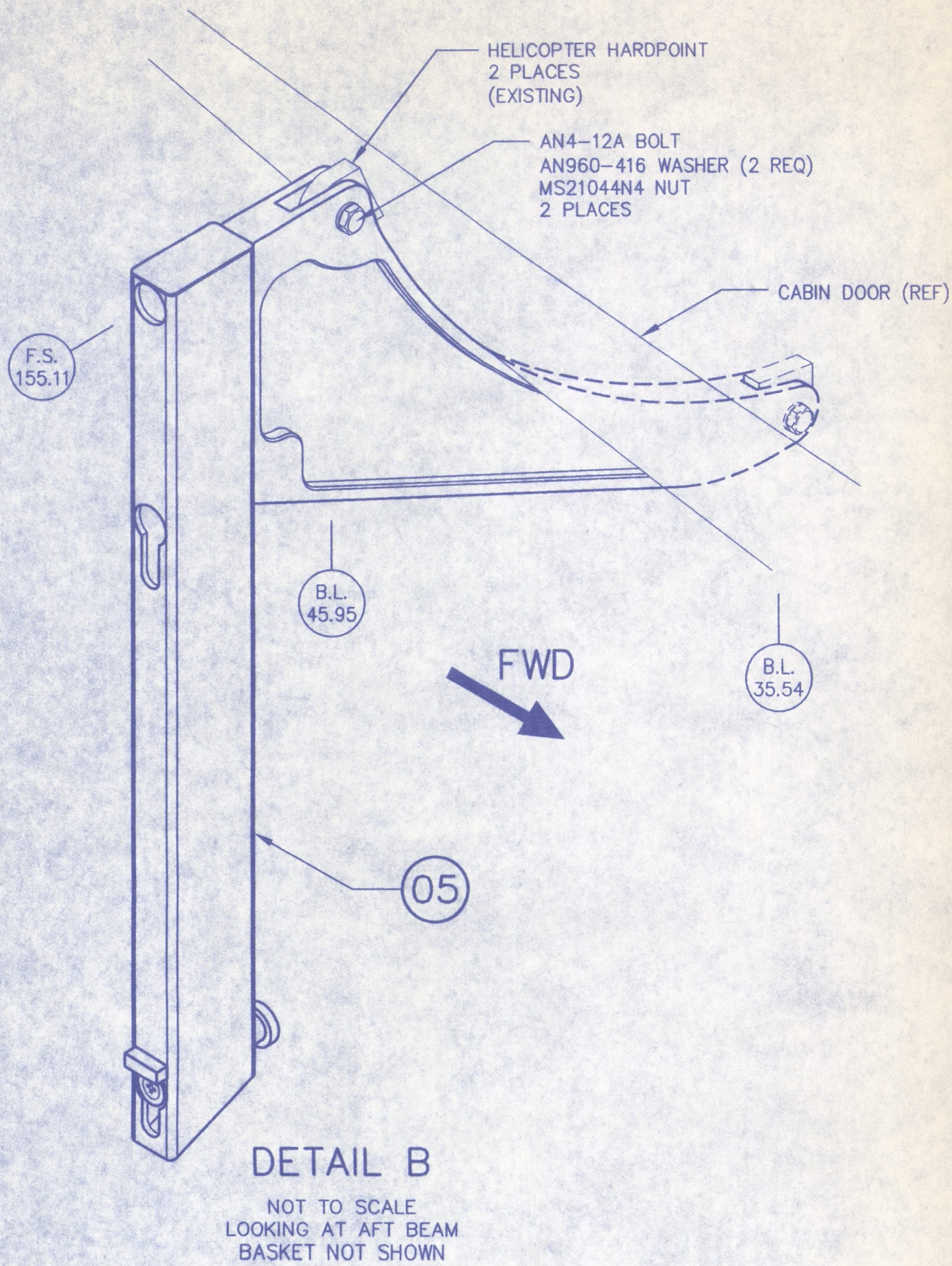
Ground clearance 11 3/4" C aft 16 1/4" C fwd

THIS DRAWING CONTAINS INFORMATION AND DATA WHICH IS PROPRIETARY TO AERO DESIGN LTD. THIS DRAWING, OR ANY PORTION THEREOF, MAY NOT BE REPRODUCED, COPIED, OR DUPLICATED IN ANY MANNER, NOR USED FOR MANUFACTURING WITHOUT THE WRITTEN CONSENT OF AERO DESIGN LTD. BY ACCEPTING THIS DRAWING FOR REFERENCE, THE RECIPIENT AGREES TO HOLD AERO DESIGN LTD. HARMLESS FROM THE USE, OR MISUSE, OF THIS DRAWING OR THE INFORMATION CONTAINED THEREON.

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		

NOTES

1. HIGH SKID GEAR INSTALLATION IS A MANDATORY PREREQUISITE FOR THIS INSTALLATION.
2. THE HELICOPTER HARD POINTS ORIGINALLY HAVE BUSHINGS INSTALLED. HARD POINTS MUST HAVE THESE BUSHINGS INSTALLED AND PRESSED FLUSH PRIOR TO INSTALLATION OF THE QUICK RELEASE CARGO BASKET PROVISIONS.
3. PROVISIONS INSTALLATION (75101-02) MAY REMAIN INSTALLED WITH THE BASKET REMOVED.
4. REFER TO FLIGHT MANUAL SUPPLEMENT, FMS751.91, FOR LIMITATIONS WITH THE QUICK RELEASE CARGO BASKET INSTALLED.
5. REFER TO INSTRUCTIONS FOR CONTINUED AIRWORTHINESS, ICA751.90, FOR MAINTENANCE INFORMATION.
6. REFER TO DRAWING 36255 FOR HANDLE INSTALLATION IF REQUIRED.
7. CARGO BASKET PROVISIONS (ITEM 02) MAY BE INSTALLED ON THE RIGHT AND/OR LEFT SIDE OF THE HELICOPTER. CARGO BASKET (ITEM 03) MAY BE INSTALLED ON THE RIGHT OR LEFT SIDE. LATERAL ARMS IN THE WEIGHT AND BALANCE ARE FOR RIGHT SIDE INSTALLATION. LEFT SIDE INSTALLATION ARMS ARE NEGATIVE.



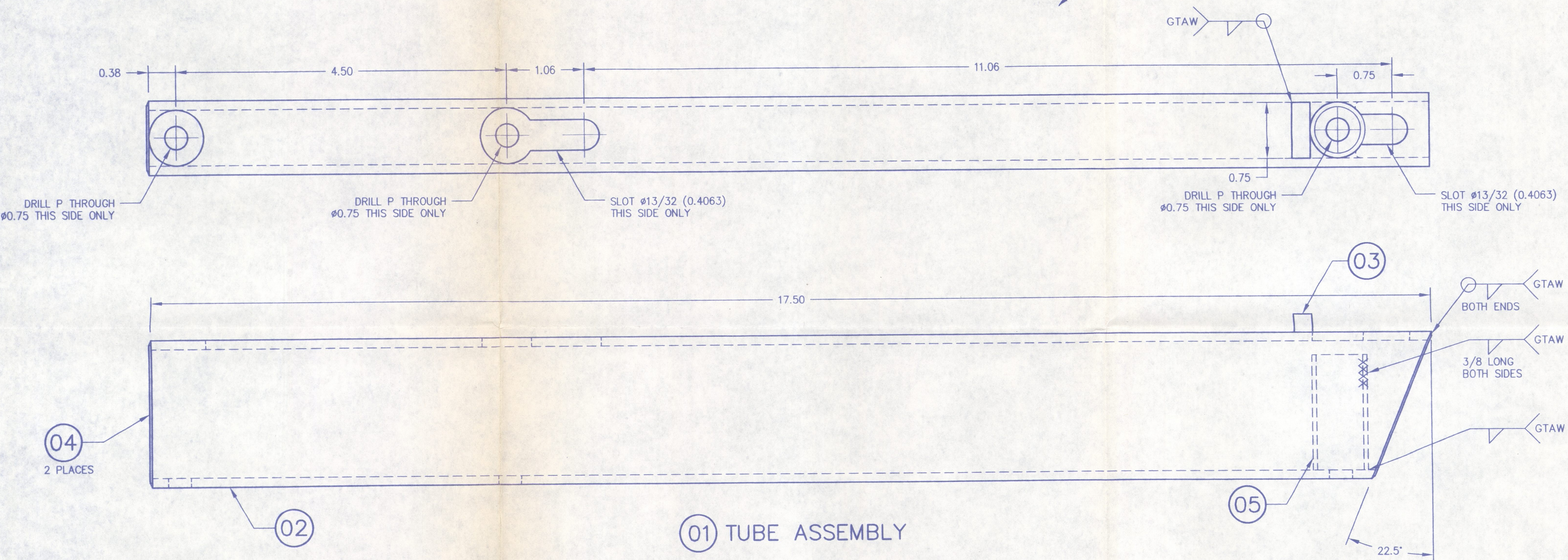
QTY	QTY	PART NO.	ITEM	DESCRIPTION
2		MS21044N4		NUT
2		MS21044N5		NUT
4		AN960-416		WASHER
4		AN960-516		WASHER
2		AN4-12A		BOLT
2		AN5-12A		BOLT
1		75116-01	05	AFT BEAM ASSEMBLY
1		75115-01	04	FORWARD BEAM ASSEMBLY
1		75110-01	03	BASKET ASSEMBLY
1		75101-02	02	PROVISIONS INSTALLATION
1		75101-01	01	INSTALLATION

WEIGHT AND BALANCE						
ITEM	DESCRIPTION	WEIGHT (LB)	LONGITUDINAL		LATERAL	
			ARM (IN)	MOMENT (LB-IN)	ARM (IN)	MOMENT (LB-IN)
04	FORWARD BEAM ASSEMBLY	5.0	84.5	422.5	46.0	230.0
05	AFT BEAM ASSEMBLY	4.6	155.1	713.5	47.3	217.6
02	PROVISIONS INSTALLATION (TOTAL)	9.6	118.3	1136.0	46.6	447.6
03	CARGO BASKET	49.5	119.5	5915.3	62.2	3078.9
01	INSTALLATION (TOTAL)	59.1	119.3	7051.3	59.7	3526.5
	CARGO (POSITIONS GIVEN ARE FOR CENTRE OF BASKET)	300 MAX	119.5	35850	62.2	18660

APPROVALS		DATE
DRAWN:	JEFF CLARKE	05 SEPT 2007
CHECKED:	E. BURGOIN	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:		
DECIMALS	X.XXX ±0.010	ANGLES ±1/2°
	X.XX ±0.03	
	X.X ±0.1	

LIST OF MATERIALS			
AERO DESIGN LTD.			
CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8087 fax: (403) 250-8333 www.aerodesign.ca			
BELL 205A-1, 212, 412 QUICK RELEASE CARGO BASKET INSTALLATION			
NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 1	A1	75101	0

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		



- NOTES
1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
 2. WELDING OF 304 STAINLESS STEEL TO BE COMPLETED BY GTAW METHOD TO AMS2685C. WELDING ROD SHALL CONFORM TO ER308L OR EQUIVALENT.
 3. ALL STEEL PARTS TO BE THOROUGHLY DEGREASED AND POWDER COATED PRIOR TO ASSEMBLY.

1	69830-11	05	GUIDE	304 STAINLESS STEEL	ASTM A269	Ø0.75 X 0.065 RND. TUBE
2	69830-19	04	CAP	321 STAINLESS COND. A	AMS 5510	0.025 SHEET
1	69830-07	03	BLOCK	304 STAINLESS STEEL	ASTM A479	0.25 SQR ROD
1	75132-02	02	TUBE	304 STAINLESS STEEL	ASTM A554	1.0 X 2.0 X 0.125 TUBE
	75132-01	01	TUBE ASSEMBLY			
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
QTY	LIST OF MATERIALS					

	APPROVALS		DATE		AERO DESIGN LTD. CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8027 fax: (403) 250-8333 www.aerodesign.ca
	DRAWN: JEFF CLARKE		01 AUG 2007		
	CHECKED: E. BURGOIN				
	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1				BELL 205A-1, 212, 412 QUICK RELEASE CARGO BASKET TUBE ASSEMBLY
SCALE 1 : 1		DWG. SIZE	DWG. NO.	REV.	
SHEET 1 OF 1		A1	75132	0	

Jeff Clarke

From: Ted [ted@aerodesign.ca]
Sent: Monday, December 17, 2007 9:53 AM
To: jeff
Subject: Fw: B205 Basket - Flight Test Report

Attachments: Aerodesign Basket - B205 - Report.doc



Aerodesign Basket -
B205 - Rep...

----- Original Message -----

From: "Brulotte, Michel" <BRULOTM@tc.gc.ca>
To: <ted@aerodesign.ca>
Cc: "Staal, Jack" <STAALJ@tc.gc.ca>
Sent: Monday, December 17, 2007 9:06 AM
Subject: B205 Basket - Flight Test Report

Ted,
I have attached the flight test report for the B205 basket test. Let me know if there are questions.
Michel
<<Aerodesign Basket - B205 - Report.doc>>

Flight Test Report

Aero Design Basket on B205

Prairie Northern Region

Test Aircraft Registration: C-FTGK

Aircraft Serial Number: 30009

Test Configuration:

Configuration was standard for type with the addition of a cargo mirror. The aircraft was flown in two different configurations:

1 – No Basket installed; T/O gross weight 8350 lbs, longitudinal CG 136.7 in, lateral CG 2.6 in.

2 – Basket installed on right side with 100 lbs of load in the basket; T/O gross weight 8400 lbs, longitudinal CG 135.9 in, lateral CG 2.5 in.

Original basis of certification: CAR 7 as per TCDS

The modified aircraft was examined against the requirements of: CAR 527.

Flight Authority: Flight Permit (Experimental)

Personnel involved were: *Michel Brulotte (AARDC), John Kettles (Guardian Helicopters), Ted Burgoin and Jeff Clarke (Aero Design)*

The subject aircraft was test flown by Michel Brulotte from Transport Canada on 11 December 2007.

Flight tests were conducted west of Springbank airport the prevailing temperatures were -2 to +2 C, test pressure altitudes were between 4500 and 7000 feet.

TEST PROGRAM

The following tests were performed:

- Normal Pre-flight Checks
- Hover and Low Speed Controllability
- Determination of Maximum Level Flight Airspeed
- Controllability in Forward Flight and at V_{NE}
- Flight at V_D ($1.11 \cdot V_{NE}$)
- Static Longitudinal Stability in Cruise Flight, in MCP Climb, and in Autorotation
- Static Directional Stability in Cruise Flight and in MCP Climb
- Autorotation Entries
- Performance Climbs AEO

DISCUSSION – Flight Characteristics and Performance

Low Speed Controllability – Low speed controllability was qualitatively assessed in ground effect at speeds up to approximately 20 knots. There were no noticeable differences between the modified and unmodified configurations.

Maximum Level Flight Airspeed V_H – The maximum level flight airspeed was found to be 100 KIAS (limited by V_{NE}) for both configurations, the power required for the basic aircraft without the basket installed was 40 psi, and with the basket installed was 45 psi.

Controllability at V_{NE} – The modified aircraft was flown at the basic aircraft V_{NE} (100 KIAS) with maximum continuous power. There were adequate control margins in level flight and in turns up to 30 degrees of bank. There was no difference noted for controllability between the modified and unmodified configurations. The longitudinal control position was identical for both the modified configurations and the unmodified configurations, which meets the FAA mast bending criteria.

Flight at Demonstration Speed ($1.11 \cdot V_{NE}$) – The aircraft was flown at speeds up to 111 KIAS using maximum continuous power. There were no unusual aircraft vibrations or handling characteristics noted at V_D .

Static Longitudinal Stability – The static longitudinal stability was assessed for the modified configuration under the following conditions: Climb, Cruise, and Autorotation. The static longitudinal stability was found to be positive for all the conditions flown with the basket installed. There were no noticeable differences between the modified and unmodified configurations.

Steady Heading Side Slips – The static lateral directional stability was assessed for both the modified configurations under the following conditions: Climb, and Cruise. The static lateral directional stability of the aircraft was assessed by performing Steady Heading Side-Slips. The static lateral directional stability was neutral in climb and cruise conditions for sideslips greater than one ball width. There were no noticeable differences between the modified and unmodified configurations.

Performance Climbs – Performance climbs were performed at 55 KIAS in the modified and unmodified configurations using maximum continuous power. There was a 150 ft/min reduction in rate of climb with a basket installed vice with no basket installed.

Controllability after Engine Failure – The controllability after sudden engine failure was assessed for the modified configuration. Simulated engine failures were simulated by rapidly reducing the throttle to idle, waiting at least one second and then reducing the collective at speeds between 40 and 100 KIAS for the modified aircraft. There was no unusual aircraft behaviour upon entry into autorotation.

RECOMMENDATIONS

Based on flight test results the Aero Design Basket modification is recommended for approval on B205, B212 and B412 aircraft with the following limitations:

VFR Only

Only one basket be installed on the aircraft, on either the left or right side.

Operating Procedures

The crew should ensure that the load is secured in the basket and that the basket is securely closed prior to flight.

The following performance information must be included in the Flight Manual Supplement:

Cruise performance, and range will be reduced by approximately 10 percent with the Basket installed.

Climb performance will be reduced by up to 150 fpm.

AERO Design Ltd.

FLIGHT TEST PLAN

FTP751.03

BELL 205A-1

QUICK RELEASE CARGO BASKET

Prepared by: J. Clarke, CET

Approved by: E. Burgoin, P.Eng., DAR 290M

Revision 0, 06 September, 2007

AERO Design Ltd.
Engineering Consultants

2013 – 39th Avenue N.E., Calgary, Alberta T2E 6R7
Phone: (403) 250-8027
Fax: (403) 250-8333
E-Mail: info@aerodesignca

Notice: This report contains information and data which is proprietary to AERO DESIGN LTD. This report, or any portion thereof, may not be reproduced, copied, duplicated or used without the written consent of AERO DESIGN LTD.

TABLE OF CONTENTS

1.0	INTRODUCTION	3
2.0	REFERENCE TEXT	3
3.0	FLIGHT TEST OBJECTIVE	3
4.0	TEST PREPARATION	4
4.1	Instrument Calibration	4
4.2	Equipment	4
4.3	Flight Test Crew	4
4.4	Documents	4
4.5	Weight and Balance	4
5.0	FLIGHT TESTS	5

1.0 INTRODUCTION

The Quick Release Cargo Basket is mounted on the right side of the helicopter. The basket is made from steel tubing and expanded steel mesh. It is quickly detachable from the mounting beams that supports it. The beams fasten to the existing helicopter hard points provided by Bell.

2.0 REFERENCE TEXT

AERO Design Ltd. Installation Drawing 75101,
AERO Design Ltd. Flight Manual Supplement FMS751.91,
Bell 205A-1 Rotorcraft Flight Manual.

3.0 FLIGHT TEST OBJECTIVE

Flight testing of the Quick Release Cargo Basket is meant to demonstrate that the installation does not produce undesirable effects to the handling and performance qualities of the helicopter.

4.0 TEST PREPARATION

4.1 Instrument Calibration

The maintenance records of the test helicopter will be checked to ensure the airspeed indicator has been calibrated within the specified time period.

4.2 Equipment

The helicopter will be fitted with the Quick Release Cargo Basket installation in accordance with drawing 75101.

4.3 Flight Test Crew

Two or three crew members will be required for the test:

- 1) Pilot with training and experience appropriate to the task of testing this equipment.
- 2) Test observer, either a DAR or a qualified alternate appointed by him, beside the pilot.
- 3) (Optional) Test observer, appointed by the DAR, seated in the aft cabin to observe the basket.

All members of the crew will be equipped to communicate via intercom.

Seating arrangement of the observer(s) may be limited by loading requirements.

4.4 Documents

These test flights require a FLIGHT PERMIT issued by Transport Canada.

The draft Flight Manual Supplement shall be on board the aircraft.

The Pilot will familiarize himself with the contents of this Test Plan and the Flight Manual Supplement prior to flight.

4.5 Weight and Balance

The helicopter will be loaded with sufficient fuel and ballast to produce the following conditions for flight:

- A) 7500 lb GW, CG within limits specified in basic flight manual,
- B) 7500 lb GW, same CG as in flight above, with Cargo Basket Installed

Loading information specific to the Quick Release Cargo Basket is contained in the Flight Manual Supplement, FMS751.91. The Cargo Basket will be loaded to the placarded maximum (300 lbs).

For each case, all ballast in the cabin will be properly secured with cargo nets and/or tie-down straps.

5.0 FLIGHT TESTS

One flight is required for each of the conditions listed in 4.5 above.

- 1 - Baseline flight, 7500 lbs GW, CG within basic Flight Manual limitations.
- 2 - Flight with cargo basket, 7500 GW, same CG location as baseline flight.

The flights are to determine the following characteristics:

a) Low Speed Controllability

The purpose of the test is to verify low speed controllability.

Hover in ground effect. Translate forward, aft, and to each side. Adjust pedals to maintain rotorcraft heading and measure cyclic stick position for each motion. If a ground wind exists, attempt to maintain position in the hover in various orientations relative to the wind. The minimum speed for which controllability must be demonstrated is 17 knots.

b) Climb Performance

The purpose of this test is to provide climb performance information to supplement what is available in the original Rotorcraft Flight Manual.

Climb at V_Y of 54 KIAS. The power level used is Maximum Continuous Power (MCP) for the climbs, and this can be based on whichever limit (Q, N1, MGT) is reached first. Determine rate of climb by timing ascent from altitude to another. Longitudinal stability and direction stability must be positive at MCP climb.

For longitudinal static stability it is necessary to change the airspeed while keeping the collective position fixed at the position necessary to have MCP power at V_Y and measure longitudinal cyclic position, then increase speed to $1.2 \cdot V_Y$ and measure control position, then slow to $0.85 \cdot V_Y$ and measure control position. The data should show that cyclic position is further forward to maintain a speed faster than the trim speed, and further aft for speeds less than trim.

For directional stability the aircraft is set in a V_Y climb, with the collective held fixed at MCP for the zero side-slip condition. The lateral cyclic, and pedal positions and aircraft bank angle are recorded for each condition. The conditions required are: ball centred, 1/2 ball right, 1 ball right, 1/2 ball left and 1 ball left. The data should show that there is an increase in left pedal position to move the ball further right, that there is a requirement to move the cyclic further right as the ball is moved further right, and that more right bank is required as the ball moves further right - the converse is true for ball moving further left.

c) Maximum Level Flight Airspeed

The purpose of this test is to identify the maximum level flight airspeed (V_H) at MCP, and to compare the un-modified to the modified condition.

Accelerate the rotorcraft at MCP until level flight can no longer be maintained. Record airspeed (V_H) at MCP. Measure longitudinal cyclic stick position at V_H .

In the modified configuration, the longitudinal cyclic stick position shall not be farther forward in the un-modified condition.

d) Level Flight Controllability

The purpose of this test is to determine static longitudinal and static lateral stability in level flight.

For longitudinal static stability it is necessary to change the airspeed while keeping the collective position fixed. Trim the helicopter at $0.9 V_H$ (power kept set as that required to maintain level flight at $0.9 V_H$ and collective kept fixed for all test points). Reduce speed to $0.7 V_H$ and measure cyclic position, then increase to $1.1 V_H$ and measure cyclic position. The data should show that cyclic position is further forward to maintain a speed faster than the trim speed, and further aft for speeds less than trim.

For directional stability trim the helicopter at $0.9 V_H$ with power set at that required to maintain level flight at $0.9 V_H$ (collective is kept fixed for all test points). The conditions required are: ball centred, 1/2 ball right, 1 ball right, 1/2 ball left and 1 ball left. The data should show that there is an increase in left pedal position to move the ball further right, that there is a requirement to move the cyclic further right as the ball is moved further right, and that more right bank is required as the ball moves further right - the converse is true for ball moving further left.

e) V_{NE}

The purpose of this test is to determine the V_{NE} and controllability at V_{NE} of the modified configuration. V_{NE} of the un-modified helicopter is sought for the modification.

Refer to basic Rotorcraft Flight Manual for further limitations and information.

$V_{NE} = 120 \text{ KIAS @ } 7500 \text{ lbs GW}$

Decrease V_{NE} by 3 kts per 1000 ft above 3000 ft H_D

Accelerate at MCP to V_{NE} . Bank 30 degrees right and measure cyclic stick position. Bank 30 degrees left and measure cyclic stick position.

f) V_D

The purpose of this test is to ensure that there are no anomalous vibrations or erratic aircraft behaviour at speeds up to V_D .

$V_D = V_{NE} / 0.9$

$V_D = 120 \text{ KIAS} / 0.9 = 133.3 \text{ KIAS @ } 7500 \text{ lbs GW}$

Decrease V_{NE} by 3 kts per 1000 ft above 3000 ft H_D

Carefully accelerate at MCP until V_D ($V_{NE}/0.9$) is reached. Observe for vibrations or erratic aircraft behaviour. Reduce power and recover.

e) Autorotation Controllability

The purpose of this test is to show that the autorotation entry characteristics and steady state autorotation are controllable.

Set the helicopter in level flight at 55 - 60 KIAS and reduce the engine to idle, delay reducing collective for 1 second, and then react normally to enter autorotation. The helicopter is maneuvered in autorotation to ensure that adequate control margins exist. There is no requirement to measure control positions unless unusual behaviour is observed. Repeat with entry at 100 KIAS.

f) Approach and Landing

Approach and land normally. If a ground wind is present, land cross-wind.

The pilot shall report to the observer any satisfactory or not satisfactory handling and controllability characteristics for each phase of the flight.

BASKET INSTALLED: (Y / N) TAKE-OFF WEIGHT: _____ C.G.: _____		CYCLIC POSITION			RESULTS	
Test Phase	Test Procedure	DIRECTION	X	Y		OK
a) HOVER	Translate slowly FORWARD 20 KIAS	STRAIGHT				
a) HOVER	Translate slowly AFT 10 KIAS	STRAIGHT				
a) HOVER	Translate slowly RIGHT 20 KIAS	RIGHT				
a) HOVER	Translate slowly LEFT 20 KIAS	LEFT				
b) CLIMB	Rate of Climb	N/A	N/A	N/A	Engine Torque: _____ Start Time: _____ Altitude: _____ Stop Time: _____ Altitude: _____	
b) CLIMB	Longitudinal Static Stability	V_Y $1.2 V_Y$ $0.85 V_Y$				
b) CLIMB	Directional Static Stability	Ball Centre $\frac{1}{2}$ Right 1 Right $\frac{1}{2}$ Left 1 Left				
c) MAX LEVEL FLIGHT	Maximum Level Flight Speed (V_H)	N/A	N/A	N/A	Engine Torque: _____ Altitude: _____ Speed Attained: _____	
d) CRUISE	Longitudinal Static Stability	$0.9 V_H$ $0.7 V_H$ $1.1 V_H$				

BASKET INSTALLED: (Y / N) TAKE-OFF WEIGHT: _____ C.G.: _____		CYCLIC POSITION			RESULTS	
Test Phase	Test Procedure	DIRECTION	X	Y		OK
d) CRUISE	Directional Static Stability	Ball Centre ½ Right 1 Right ½ Left 1 Left				
e) V_{NE}	Descend & apply power as required $V_{NE} = 120$ KIAS	STRAIGHT RIGHT LEFT			Engine Torque: _____ Speed Attained: _____	
f) V_D	Descend & apply power as required $V_D = 133.3$ KIAS	N/A	N/A	N/A	Engine Torque: _____ Speed Attained: _____	
AUTOROTATE	Entry speed 55-60 KIAS				Entry Altitude: _____	
AUTOROTATE	Entry speed 100 KIAS				Entry Altitude: _____	
HANDLING	NOTE ANY COMMENTS OR OBSERVATIONS					

The test described above has been performed in accordance with the applicable standards of airworthiness.		
Signed: _____	Date: _____	Aircraft Make/Model: _____
Approval #: _____		Aircraft Serial No./Registration: _____

Jeff Clarke

From: Staal, Jack [STAALJ@tc.gc.ca]
Sent: Wednesday, November 28, 2007 11:21 AM
To: jeff@aerodesign.ca
Subject: RE: Cargo Basket Revisions C-07-1032 is NAPA file.

Jeff,

I have the following comments from Flight Test on the FTP. I will just forward them as a direct quote

" have the following comments on the test plan:

Section 5 (a) - The purpose of the test is to verify low speed controllability. The pedals do not need to be held neutral, but have to be adjusted to maintain aircraft heading. The data that must be recorded is longitudinal cyclic, lateral cyclic and pedal positions. The minimum speed for which controllability must be demonstrated is 17 knots.

Section 5 (b) - The purpose of the test is to provide climb performance information to supplement what is available in the OEM RFM. The Bell mediums use a VY of 54 KIAS I believe, so that is the speed that should be used to measure climb rates. The power level used is Maximum Continuous Power (MCP) for the climbs, and this could be based on whichever limit (Q, N1, MGT) is reached first. There is no need to measure control margins in climb, or climbing turns. There is a requirement to show that the static longitudinal stability and static lateral/directional stability is positive at MCP climb.

For longitudinal static stability it is necessary to change the airspeed while keeping the collective position fixed at the position necessary to have MCP power at VY and measuring longitudinal cyclic position, then increasing speed to $1.2 \times VY$ and measuring control position, and slowing to $0.85 \times VY$ and measuring control position. The data should show that cyclic position is further forward to maintain a speed faster than the trim speed, the converse is true for speeds less than trim. It is also necessary to demonstrate static longitudinal stability in level flight and steady autorotation. For level flight the trim speed is 0.9 VH (power kept set as that required to maintain level flight at 0.9 VH and collective kept fixed for all test points) and speed band is 0.7 VH to 1.1 VH. For autorotation we generally go from 40 knots to 100 knots for Bell mediums.

For directional stability the aircraft is set in a VY climb, with the collective held fixed at MCP for the zero side-slip condition. The lateral cyclic, and pedal positions and aircraft bank angle are recorded for each condition. The conditions required are: ball centred, 1/2 ball right, 1 ball right, 1/2 ball left and 1 ball left. The data should show that there is an increase in left pedal position to move the ball further right, that there is a requirement to move the cyclic further right as the ball is moved further right, and that more right bank is required as the ball moves further right - the converse is true for ball moving further left. It is also necessary to demonstrate this for level flight at 0.9 VH with power set at that required to maintain level flight at 0.9 VH (collective is kept fixed for all test points)

Section 5 (c) (d) the purpose of these sections is unclear. They do not help in showing compliance with the regulations. There is a requirement to identify the maximum level flight airspeed (VH) using MCP, and to measure the control positions at that condition. This is used to compare the modified and unmodified configurations and to verify that the longitudinal control position in the modified configuration is no further forward than for the unmodified configuration.

Section 5 (e) - Vne and Vd test. This test is conducted with power at MCP. The aircraft is accelerated to Vne and the control positions are measured, the aircraft is banked 30 degrees right and control positions are measured, the aircraft is banked 30 degrees left and control positions are measured. This is to establish that the aircraft is controllable and has adequate control margins at the proposed basket Vne (which could be basic aircraft Vne). The aircraft is then carefully accelerated to Vd ($1.11 \times \text{proposed Vne}$). The intent of this test is to ensure that there are no anomalous vibrations or erratic aircraft behaviour at speeds up to Vd.

Section 5 (f) - Autorotation Controllability - The intent of the test is to show that the autorotation entry characteristics and steady state autorotation are controllable. The aircraft is set in level flight and the engine(s)

11/28/2007

AERO DESIGN LTD.

2013 – 39th Ave N. E., Calgary, Alberta, T2E 6R7

aerodesign@telusplanet.net

F A X C O V E R S H E E T

DATE: November 27, 2007

TIME: 1:48 PM

TO: **Louie**

PHONE: 730-6333

Guardian Helicopters

FAX: 730-6312

FROM: J. Clarke
Aero Design Ltd.

PHONE: 403-250-8027

FAX: 403-250-8333

Number of pages including cover sheet: 9

RE: BELL 205A-1 QUICK RELEASE CARGO BASKET

Louie,

Please complete the attached Flight Permit application and submit to your PMI. He can contact Jack Staal at Aircraft Certification in Edmonton if there are any questions regarding the flight permit.

Also attached is the flight test plan.

Let me know if you have any questions.



Jeff



Transport Canada
Transports Canada
Aviation Aviation

APPLICATION FOR A
FLIGHT PERMIT

DEMANDE DE
PERMIS DE VOL

INSTRUCTIONS

Print or type all entries. See Airworthiness Manual Chapter 507D and Airworthiness Manual Advisory AMA 507D/1 for the use and disposition of this form.
Dactylographier ou écrire en lettres moulées. Consulter le chapitre 507D du Manuel de navigabilité et la circulaire consultative AMA 507 D/1 qui précisent la façon de remplir et d'acheminer la présente formule.

A. AIRCRAFT IDENTIFICATION IDENTIFICATION DE L'AÉRONEF

1. Owner - Propriétaire Guardian Helicopters Inc.			
2. Address - Adresse 538 Hurricane Drive, Calgary, Alberta, T3Z 3S8			
3. Aircraft Manufacturer - Constructeur de l'aéronef Bell	4. Model - Modèle 205A-1	5. Serial Number - Numéro de série	6. Nationality and Registration Marks Marques de nationalité et d'immatriculation

B. FLIGHT PERMIT REQUESTED - Check applicable boxes PERMIS DE VOL DEMANDÉ - Cocher la ou les case(s) voulue(s)

1. ☐ Experimental Flight Permit
Permis de vol expérimental
2. ☒ Specific Purpose Flight Permit
Permis de vol à une fin spécifique
- (a) ☐ Ferry Flight
Vol de convoyage
- (b) ☐ Importation or Exportation Flight
Vol à l'importation ou à l'exportation
- (c) ☐ Demonstration, Market Survey or Crew Training
Vol de démonstration, étude de marché ou formation d'équipage
- (d) ☒ Flight Test following repair, modification or maintenance
Essais en vol après réparation, modification ou maintenance
- (e) ☐ Other purpose (Specify)
Autre fin (Préciser)

C. FLIGHT DESCRIPTION AND AIRCRAFT LIMITATIONS
Description of Flight(s) Use attachment when appropriate

DESCRIPTION DU VOL ET LIMITATIONS DE L'AÉRONEF
Description du ou des vol(s) Joindre une feuille au besoin

1. From - Aéroport de départ CYBW - Springbank, AB	2. To - Aéroport de destination CYBW - Springbank, AB	
3. Via - Escales None	4. Date November 28, 2007	5. Duration - Durée 90 days

6. Aircraft does not meet the applicable airworthiness requirements as follows: - Raisons pour lesquelles l'aéronef ne satisfait pas aux exigences de navigabilité en vigueur:

Installation of Quick Release Cargo Basket on the right side of the cabin in accordance with AERO Design Ltd. Document Control List DCL751-1.

Flight to Vd ($V_{ne}/0.9 = 120 \text{ kts} / 0.9 = 133.3 \text{ kts}$) in accordance with AERO Design Ltd. Flight Test Plan FTP751.03.

Flight test is in support of STC application.

7. The following restrictions are considered necessary for safe operations: - Les restrictions suivantes sont nécessaires pour la conduite des vols en toute sécurité:

- No flight over built up areas
- Essential crew only
- Day VFR conditions
- Testing in accordance with AERO Design Ltd. Flight Test Plan FTP751.03
- Flight to Vd = 133.3 kts

D. CERTIFICATION

I hereby certify that the aircraft described above is in a condition for safe operation.

Je, soussigné, certifie que l'aéronef décrit ci-dessus est en bon état de vol.

Signature

Date (Y-A - M - D-J)

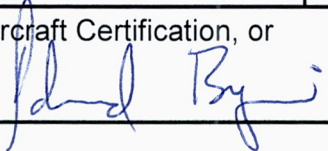
- ☐ Registered Owner as shown on the Certificate of Registration
Propriétaire enregistré selon le certificat d'immatriculation
- ☐ Authorized Representative
Représentant autorisé

STAFF INSTRUCTION 513-008

Flight Test Division Support of Regional Flight Test Activities

Appendix A – Statement of Suitability for Flight Test

Aircraft Type/Model	Bell 205A-1
Registration	C-FTGK
Serial Number	
Description of Design Change(s)	Installation of Aero Design Ltd. Quick Release Cargo Basket on the right side of the helicopter below the cabin door.
Design Drawings	See Document Control Lists DCL751-1, DCL751-2 and DCL751-3

Statement of Suitability for Flight Test	
This is to certify that I have reviewed the subject design change and that I have reasonable assurance that compliance could be found with all applicable design requirements, except for those requirements that will be substantiated by flight-testing. I consider the aircraft to be safe for flight.	
Regional Engineer, Aircraft Certification, or Authorized Person 	Date 01 DEC 2007

AERO Design Ltd.

**ENGINEERING REPORT
ER751.01**

QUICK RELEASE CARGO BASKET

Bell 205A-1, 212, 412

Approved: E. Burgoin, P. Eng.

Prepared by: Jeff Clarke

Revision 0

Date: 18 July, 2007

AERO Design Ltd.
Engineering Consultants

2013 – 39th Avenue N.E., Calgary, Alberta T2E 6R7
Phone: (403) 250-8027
Fax: (403) 250-8333
E-Mail: info@aerodesign.ca

Notice: This report contains information and data which is proprietary to ***AERO*** Design Ltd. This report, or any portion thereof, may not be reproduced, copied, duplicated or used without the written consent of ***AERO*** Design Ltd.

TABLE OF CONTENTS

1.0	INTRODUCTION	3
2.0	REFERENCE	3
3.0	BASIS OF CERTIFICATION	3
4.0	ANALYSIS OF CURRENT AIRWORTHINESS DIRECTIVES (AD'S)	3
5.0	LOADS	4
5.1	Inertia Loads	5
5.2	Drag Load	6
6.0	STRUCTURAL COMPLIANCE	7
6.1	Basket	7
6.2	Tube (Steel)	7
6.3	Beams (Aluminum)	7
7.0	COMPLIANCE WITH FAR 29.1387 AND 29.1401	13
	APPENDIX A	15

1.0 INTRODUCTION

The quick release cargo basket developed for the Bell 206L and 407 is the right size for operators on forestry contracts using Bell 205A-1/212 helicopters. The contract requires a bambi-bucket, chain saw, and a few jerry cans of gasoline. All of these items fit within the 206L basket and are within the existing 200 lbs weight limitation.

A quick release basket for the Bell 205A-1 and 212 must be shortened about 3" to fit within the existing hard points under the main cabin door of the helicopter. With the exception of the change in length, the remainder of the construction of the basket is unchanged. The allowable load in the basket is increased to 300 lbs to remain competitive with existing products.

2.0 REFERENCE

AERO Design Ltd. Drawings 75101

AERO Design Ltd. Test Report TR362.02

MIL-HDBK-5J

3.0 BASIS OF CERTIFICATION

Bell 205A-1, TCDS H1SW:

CAR 7 dated August 1, 1956, Amendments 7-1 through 7-4, Category B, and Special Conditions for Turbine Powered Rotorcraft dated June 16, 1961, and amended June 21, 1967.

Bell 212/412 TCDS H-86:

FAR Part 29 dated 1 February 1965, Amendments 29-1 and 29-2, and FAR 29.473, 29.501, 29.771, 29.903(c), 29.1323, and 29.1505(b) of Amend. 29-3,

FAR 29.663 of Amendment 29-3 (412 only).

This installation:

Same as the basis of certification for Bell 412 as shown on TCDS H-86.

4.0 ANALYSIS OF CURRENT AIRWORTHINESS DIRECTIVES (AD'S)

Current AD's for Bell 205A-1, 212 and 412 were checked. This installation does not impact on any current ADs.

5.0 LOADS

BELL 412 HELICOPTER LOAD FACTORS, FAR 29:

FAR 29.561(b)(3)

Ultimate Upward Emergency Landing Load Factor:	$n_{e_up} := 1.5$
Ultimate Forward Emergency Landing Load Factor:	$n_{e_fwd} := 4.0$
Ultimate Sideward Emergency Landing Load Factor:	$n_{e_side} := 2.0$
Ultimate Downward Emergency Landing Load Factor:	$n_{e_down} := 4.0$

FAR 29.625	Fitting Factor (does not apply to articles being tested):	$n_{ff} := 1.15$
------------	---	------------------

FAR 29.303	Safety Factor:	$n_{sf} := 1.5$
------------	----------------	-----------------

FAR 29.337(a)

	Limit Positive Manouvering Load Factor:	$n_{man} := 3.5$
$n_{man_ult} := n_{man} \cdot n_{sf}$	Ultimate Positive Manouvering Load Factor:	$n_{man_ult} = 5.25$
	Limit Negative Manouvering Load Factor:	$n_{man_neg} := -1.0$
$n_{man_neg_u} := n_{man_neg} \cdot n_{sf}$	Ultimate Negative Manouvering Load Factor:	$n_{man_neg_u} = -1.5$

CRITICAL ULTIMATE LOAD FACTORS:

Downward:	Ultimate Positive Manouvering Load Factor:	$n_{man_ult} = 5.25$
Forward:	Ultimate Forward Emergency Landing Load Factor:	$n_{e_fwd} = 4$
Sideward:	Ultimate Sideward Emergency Landing Load Factor:	$n_{e_side} = 2$
Upward:	Ultimate Upward Emergency Landing Load Factor:	$n_{e_up} = 1.5$

Note: The basket is mounted below and to one side of the cabin. Forward deflection or failure in the emergency landing condition does not endanger the occupants. Likewise, Sideward and Upward deflection or failure of the basket in the emergency landing condition do not endanger the occupants.

Sideward and Upward Load Factors are used in the tests to ensure that the lid of the basket does not open in flight.

5.1 Inertia Loads

Quick Release Cargo Basket

$$W_{\text{basket}} := 55 \text{ lbf}$$

Weight of basket

$$W_{\text{cargo}} := 300 \text{ lbf}$$

Weight of cargo (max)

$$P_{\text{basket}} := W_{\text{basket}} + W_{\text{cargo}}$$

$$P_{\text{basket}} = 355 \text{ lbf}$$

Combined weight of basket and cargo

$$P_{\text{lim_man}} := P_{\text{basket}} \cdot n_{\text{man}}$$

$$P_{\text{lim_man}} = 1242.5 \text{ lbf}$$

Limit maneuvering load

$$P_{\text{ult_man}} := P_{\text{basket}} \cdot n_{\text{man_ult}}$$

$$P_{\text{ult_man}} = 1863.8 \text{ lbf}$$

Ultimate maneuvering load

$$P_{\text{lim_cargo_neg}} := W_{\text{cargo}} \cdot n_{\text{man_neg}}$$

$$P_{\text{lim_cargo_neg}} = -300 \text{ lbf}$$

Limit negative maneuvering load due to cargo

$$P_{\text{ult_cargo_neg}} := W_{\text{cargo}} \cdot n_{\text{man_neg_u}}$$

$$P_{\text{ult_cargo_neg}} = -450 \text{ lbf}$$

Ultimate negative maneuvering load due to cargo

5.2 Drag Load

$$l_{\text{basket}} := 72 \cdot \text{in}$$

Length of basket.

$$w_{\text{basket}} := 22 \cdot \text{in}$$

Width of basket.

$$h_{\text{basket}} := 17 \cdot \text{in}$$

Height of basket.

$$A_f := w_{\text{basket}} \cdot h_{\text{basket}}$$

$$A_f = 374 \text{in}^2$$

Frontal Area of basket.

$$A_p := l_{\text{basket}} \cdot w_{\text{basket}}$$

$$A_p = 1584 \text{in}^2$$

Planar Area of basket.

$$\frac{l_{\text{basket}}}{w_{\text{basket}}} = 3.3$$

Fineness ratio of basket

$$C_{D0} := 1.6$$

Drag Coefficient of Basket, (overestimated)
(Ref. Hoerner, Fluid Dynamic Drag, Figure 22).

$$\rho := 0.002378 \frac{\text{slug}}{\text{ft}^3}$$

Density of air at Sea Level.

$$V_{\text{ne}} := 140 \text{knots}$$

Never-Exceed-Speed of Bell 412.
(Ref. Bell 412 Flight Manual.)
(Highest of 205A-1, 212 and 412)

$$V_d := \frac{V_{\text{ne}}}{0.9}$$

$$V_d = 156 \text{knots}$$

Design Dive Speed of Bell 412

$$\text{Drag} := \frac{\rho}{2} \cdot V_d^2 \cdot A_f \cdot C_{D0}$$

$$\text{Drag} = 341 \text{lbf}$$

Limit Drag on basket.

$$\text{Drag}_{\text{ult}} := \text{Drag} \cdot n_{\text{sf}}$$

$$\text{Drag}_{\text{ult}} = 511 \text{lbf}$$

Ultimate Drag load on basket

$$AC_{\text{drag}} := 60.3 \cdot \text{in}$$

Lateral Aerodynamic Center of basket.

6.0 STRUCTURAL COMPLIANCE

6.1 Basket

Structural compliance of the basket assembly and its attachment to the beams is shown by test. Refer to TR751.02 for load tests on the basket.

6.2 Tube (Steel)

Structural compliance of the steel tube is shown by test. Refer to TR751.02 for load test.

6.3 Beams (Aluminum)

Strength of the aluminum beams is shown by analysis.

Assuming 1/2 cargo load is carried at each end.

Load on basket-beam attachments

$$P_{\text{end}} := \frac{W_{\text{basket}}}{2} + \frac{W_{\text{cargo}}}{2}$$

$$P_{\text{end}} = 177.5 \text{ lbf}$$

Total weight on each end of basket

Where:

$$W_{\text{basket}} = 55 \text{ lbf}$$

Weight of basket

$$W_{\text{cargo}} = 300 \text{ lbf}$$

Weight of cargo

$$P_{\text{lim_end}} := P_{\text{end}} \cdot n_{\text{man}}$$

$$P_{\text{lim_end}} = 621.3 \text{ lbf}$$

Limit load due to basket installation on attachment to beam

Where:

$$n_{\text{man}} = 3.5$$

$$P_{\text{ult_end}} := P_{\text{end}} \cdot n_{\text{man_ult}}$$

$$P_{\text{ult_end}} = 931.9 \text{ lbf}$$

Ultimate load due to basket installation on attachment to beam

Where:

$$n_{\text{man_ult}} = 5.25$$

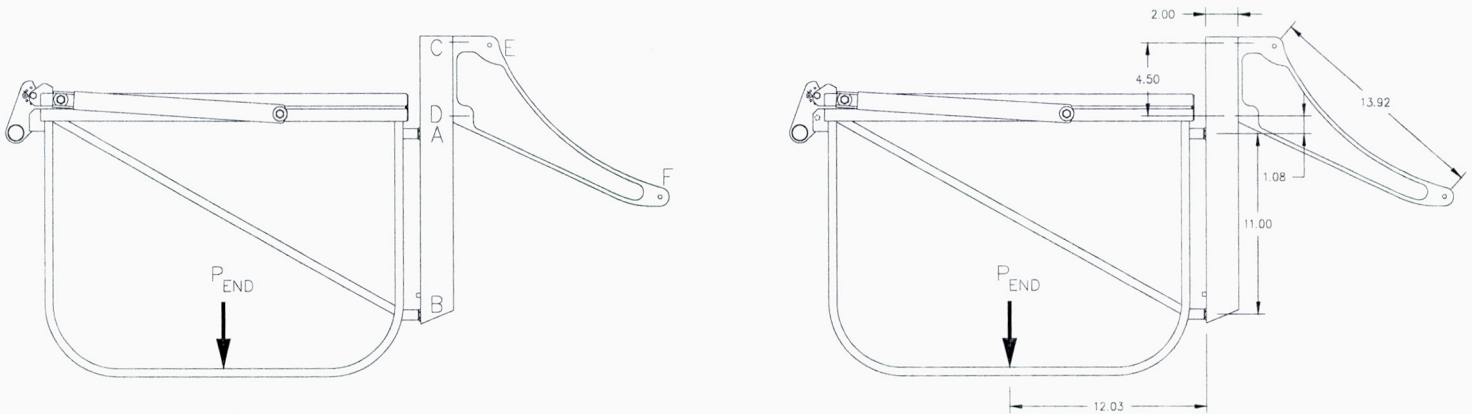


Figure 6.3.1 – Free Body Diagram

Basket attachment loads:

Sum moments about A = 0:

$$R_{Bx} := \frac{P_{ult_end} \cdot 12.03 \text{ in}}{11 \text{ in}}$$

$$R_{Bx} = 1019.11 \text{ lbf}$$

Horizontal reaction at B

Sum forces horizontally = 0:

$$R_{Ax} := R_{Bx}$$

$$R_{Ax} = 1019.11 \text{ lbf}$$

Horizontal reaction at A

Shear (vertical load) is carried by the top attachment:

$$R_{Ay} := P_{ult_end}$$

$$R_{Ay} = 931.91 \text{ lbf}$$

Vertical reaction at A

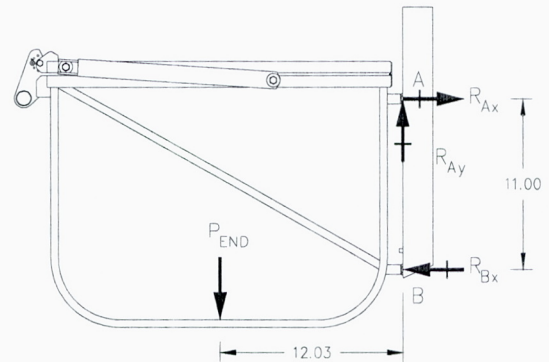


Figure 6.3.2 – Basket Reactions

Reaction on attachment of steel beam to aluminum beam:

Sum moments about C = 0:

$$R_{Dx} := \frac{-R_{Ax} \cdot 5.58 \text{ in} + R_{Bx} \cdot 16.58 \text{ in} + R_{Ay} \cdot 2 \text{ in}}{4.5 \text{ in}}$$

$$R_{Dx} = 2905.41 \text{ lbf}$$

Horizontal Reaction at D

Sum forces horizontally = 0:

$$R_{Cx} := R_{Dx}$$

$$R_{Cx} = 2905.41 \text{ lbf}$$

Horizontal reaction at C

Assume vertical load is carried at top attachment:

$$R_{Cy} := R_{Ay}$$

$$R_{Cy} = 931.91 \text{ lbf}$$

Vertical reaction at C

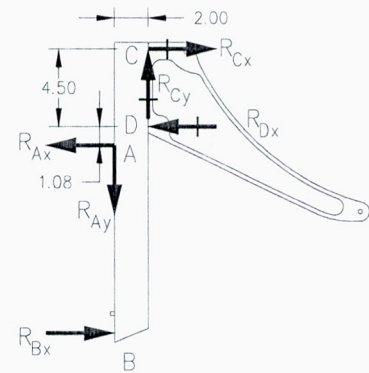


Figure 6.3.3 – Beam Reactions

The AN5 bolts attaching tube to aluminum beam are demonstrated to be acceptable in the load test documented in TR751.02. The bolts were threaded into steel in the test. The actual beam is aluminum with a helicoil. The insert must not pull out.

Helicoil is 1.5D deep (0.469"). Beam is 6061-T6 Aluminum. Check pull out of insert:

$$D_p := 0.328 \text{ in}$$

Pitch diameter (5/16 helicoil tap drill)

$$A_s := \pi \cdot D_p \cdot \frac{1}{2} \cdot 0.469 \text{ in}$$

$$A_s = 0.242 \text{ in}^2$$

Shear area through threads

$$f_s := \frac{R_{Cx}}{A_s}$$

$$f_s = 12 \text{ ksi}$$

Ultimate shear stress on threads

Where:

$$R_{Cx} = 2905.41 \text{ lbf}$$

Horizontal reaction at C

$$F_{su_6061} := 26 \text{ ksi}$$

Ultimate shear strength of 6061-T6 Aluminum extruded bar
(Ref: MIL-HDBK-5J)

$$MS := \frac{F_{su_6061}}{f_s} - 1$$

$$MS = 1.2$$

Margin of Safety

MARGIN OF SAFETY IS POSITIVE

Reaction at helicopter attachments. Aft beam is critical because the fittings are closer together.

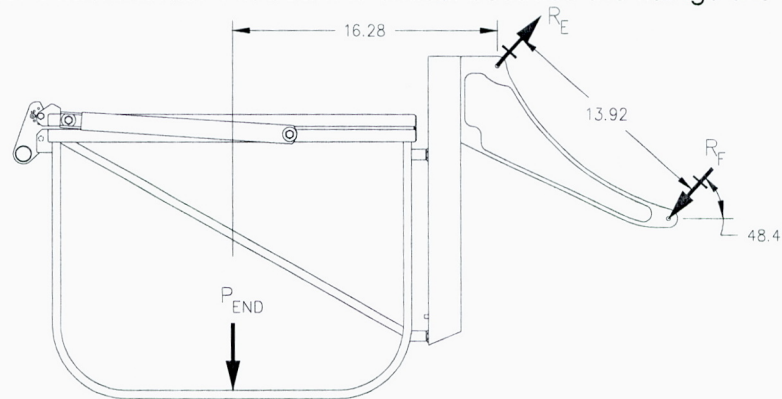


Figure 6.3.4 – Fitting Reactions

Reaction at helicopter fittings. Aft beam is critical because the fittings are closer together.

Sum moments about E = 0

$$R_F := \frac{P_{ult_end} \cdot 16.28 \text{ in}}{13.919 \text{ in}}$$

$$R_F = 1089.9 \text{ lbf}$$

Ultimate Reaction at F

Where: $P_{ult_end} = 931.9 \text{ lbf}$ Ultimate load from basket on each end

$$R_{Fx} := R_F \cdot \cos(48.4 \text{ deg})$$

$$R_{Fx} = 723.6 \text{ lbf}$$

Horizontal component of R_F (inboard fitting)

$$R_{Fy} := R_F \cdot \sin(48.4 \text{ deg})$$

$$R_{Fy} = 815.1 \text{ lbf}$$

Vertical Component of R_F (inboard fitting)

Sum forces vertically = 0:

$$R_{Ey} := P_{ult_end} + R_{Fy}$$

$$R_{Ey} = 1746.9 \text{ lbf}$$

Vertical component of R_E (outboard fitting)

Sum forces horizontally = 0

$$R_{Ex} := R_{Fx}$$

$$R_{Ex} = 723.6 \text{ lbf}$$

Horizontal component of R_E (outboard fitting)

$$R_E := \sqrt{R_{Ex}^2 + R_{Ey}^2}$$

$$R_E = 1890.9 \text{ lbf}$$

Ultimate Reaction at E

Aft beam is attached with AN4 bolts to the helicopter fittings in double shear. Outboard fitting is critical.

$$P_{su_AN4} := 3680 \text{ lbf}$$

Ultimate single shear strength of AN4 bolt
(Ref: MIL-HDBK-5J)

$$MS := \frac{2 \cdot P_{su_AN4}}{R_E} - 1$$

$$MS = 2.9$$

Margin of Safety

MARGIN OF SAFETY IS POSITIVE

The outboard attachment is critical because it has the highest applied loads.

Tension on lug:

$$p_t := R_E$$

$$p_t = 1890.9 \text{ lbf}$$

Ultimate tension load on lug

$$A_t := (1.912 \text{ in} - 0.25 \text{ in}) \cdot 0.198 \text{ in} \cdot 2$$

$$A_t = 0.658 \text{ in}^2$$

Tension area through bolt hole

$$f_t := \frac{p_t}{A_t}$$

$$f_t = 2.9 \text{ ksi}$$

Ultimate tensile stress on lug

$$F_{tu_6061} := 38 \text{ ksi}$$

Ultimate tensile strength of 6061-T6 Aluminum extruded bar

$$MS := \frac{F_{tu_6061}}{f_t} - 1$$

$$MS = 12.2$$

Margin of Safety

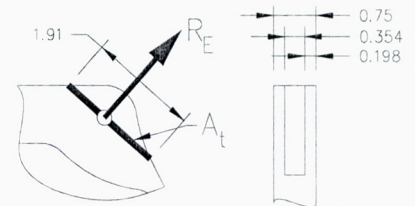
MARGIN OF SAFETY IS POSITIVE

Figure 6.3.5 – Tension on Lug

Shear tear out of lug:

$$p_s := R_E$$

$$p_s = 1890.9 \text{ lbf}$$

Ultimate shear load on lug

$$A_s := 0.198 \text{ in} \cdot 0.545 \text{ in} \cdot 4$$

$$A_s = 0.432 \text{ in}^2$$

Shear tear out area

$$f_s := \frac{p_s}{A_s}$$

$$f_s = 4.4 \text{ ksi}$$

Ultimate shear stress

$$F_{su_6061} = 26 \text{ ksi}$$

Ultimate shear strength of 6061-T6 Aluminum extruded bar
(Ref: MIL-HDBK-5J)

$$MS := \frac{F_{su_6061}}{f_s} - 1$$

$$MS = 4.9$$

Margin of Safety

MARGIN OF SAFETY IS POSITIVE

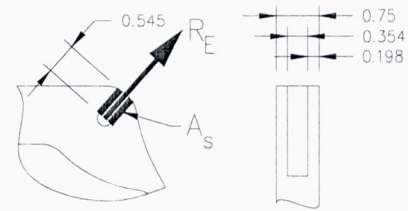


Figure 6.3.6 – Shear Tear Out on Lug

Bearing of bolt on lug:

$$p_{br} := R_E$$

$$p_{br} = 1890.9 \text{ lbf}$$

Ultimate bearing load on lug

$$A_{br} := 0.25 \text{ in} \cdot 0.198 \text{ in} \cdot 2$$

$$A_{br} = 0.099 \text{ in}^2$$

Bearing area

$$f_{br} := \frac{p_{br}}{A_{br}}$$

$$f_{br} = 19.1 \text{ ksi}$$

Ultimate bearing stress

$$F_{br_6061} := 82 \cdot \text{ksi}$$

Ultimate shear strength of 6061-T6 Aluminum extruded bar
(Ref: MIL-HDBK-5J)

$$MS := \frac{F_{br_6061}}{f_{br}} - 1$$

$$MS = 3.3$$

Margin of Safety

MARGIN OF SAFETY IS POSITIVE

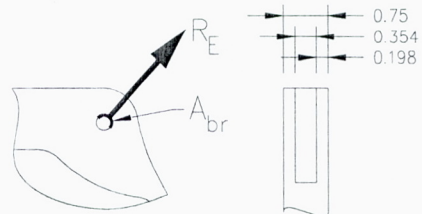


Figure 6.3.7 – Bearing on Lug

Note that fitting factor (FAR 29.625) was not included. All margins of safety are positive if the fitting factor of 1.15 is applied.

Helicopter Fitting Loads

Applied Loads:

$R_{Ey} = 1746.9\text{ lbf}$	Outboard vertical reaction
$R_{Ex} = 723.6\text{ lbf}$	Outboard horizontal reaction
$R_{Fy} = 815.1\text{ lbf}$	Inboard vertical reaction
$R_{Fx} = 723.6\text{ lbf}$	Inboard horizontal reaction
$P_{\text{drag_ult}} = 510.9\text{ lbf}$	Ultimate drag load (distributed over attachments)

Allowable fitting limit loads acting simultaneously, reference Bell Service Letter 205A-39:

Outboard fittings

$P_{y_ob} := 3060\text{ lbf}$	Allowable vertical load
$P_{x_ob} := 1310\text{ lbf}$	Allowable horizontal load
$P_{\text{fwd_ob}} := 1700\text{ lbf}$	Allowable fore/aft load

Inboard fittings

$P_{y_ib} := 1560\text{ lbf}$	Allowable vertical load
$P_{x_ib} := 1310\text{ lbf}$	Allowable horizontal load
$P_{\text{fwd_ib}} := 1700\text{ lbf}$	Allowable fore/aft load

ULTIMATE REACTIONS DO NOT EXCEED ALLOWABLE LIMIT LOADS

Bending of the Beam

The aluminum beam has bending applied in 2 planes due to the ultimate maneuvering load and ultimate drag load. The basket is rigid enough that it carries the moment due to drag to the outboard edge of the steel tube.

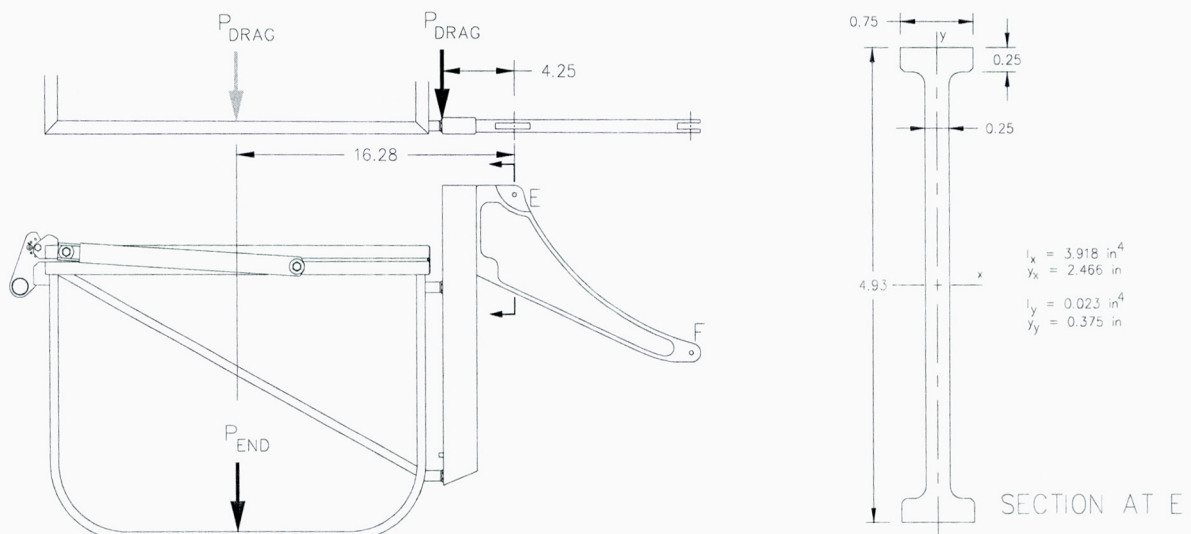


Figure 6.3.8 – Beam Bending

$$M_{\text{drag}} := \frac{P_{\text{drag_ult}}}{2} \cdot 4.25 \text{ in}$$

$$M_{\text{drag}} = 1085.7 \text{ in} \cdot \text{lbf}$$

Moment due to drag
Where:

$$P_{\text{drag_ult}} = 510.9 \text{ lbf} \quad \text{Ultimate drag load on basket}$$

$$f_{b_drag} := \frac{M_{\text{drag}} \cdot 0.375 \text{ in}}{0.023 \text{ in}^4}$$

$$f_{b_drag} = 17.7 \text{ ksi}$$

Ultimate bending stress due to drag

$$M_{\text{man}} := P_{\text{ult_end}} \cdot 16.28 \text{ in}$$

$$M_{\text{man}} = 15170.9 \text{ in} \cdot \text{lbf}$$

Moment due to drag
Where:

$$P_{\text{ult_end}} = 931.9 \text{ lbf} \quad \text{Ultimate maneuvering load on each end of basket}$$

$$f_{b_man} := \frac{M_{\text{man}} \cdot 2.466 \text{ in}}{3.918 \text{ in}^4}$$

$$f_{b_man} = 9.5 \text{ ksi}$$

Ultimate bending stress due to maneuvering load

Add stresses directly without interaction formula (both are bending stress).

$$f_{b_total} := f_{b_drag} + f_{b_man}$$

$$f_{b_total} = 27.2 \text{ ksi}$$

$$F_{tu_6061} = 38 \text{ ksi}$$

Ultimate tensile strength of 6061-T6

$$MS := \frac{F_{tu_6061}}{f_{b_total}} - 1$$

$$MS = 0.4$$

Margin of Safety

MARGIN OF SAFETY IS POSITIVE

7.0 COMPLIANCE WITH FAR 29.1387 AND 29.1401

The helicopter is fitted with both upper and lower position and anti-collision lights. The lower position light is far enough forward that the basket does not block the required 110° angle. The upper anti-collision light is on top of the engine cowling, and can be seen at any angle where the basket may block the lower anti-collision light. See figure 7.0.1 for lower light positions.

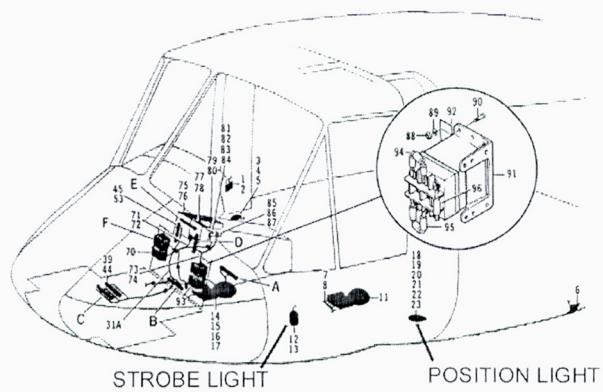


Figure 7.0.1 – Light Positions

APPENDIX A

BELL SERVICE LETTER 205A-39



**BELL
HELICOPTER COMPANY**

POST OFFICE BOX 482 • FORT WORTH TEXAS 76101 • A **Textron** COMPANY

SERVICE LETTER

NO. 205A-39

1 August 1969
35:OES:rb-3803

TO: All 205A/205A-1 Helicopter Operators
SUBJECT: EXTERNAL LOAD CARRYING HARD POINTS
REASON: Provide information concerning utilization
and location of hard point fittings.

D.E.R. APPROVAL: *SW-122 E.M. Asplund*

HELICOPTERS AFFECTED: All 205A/205A-1 Helicopters

ACCOMPLISHMENT: N/A

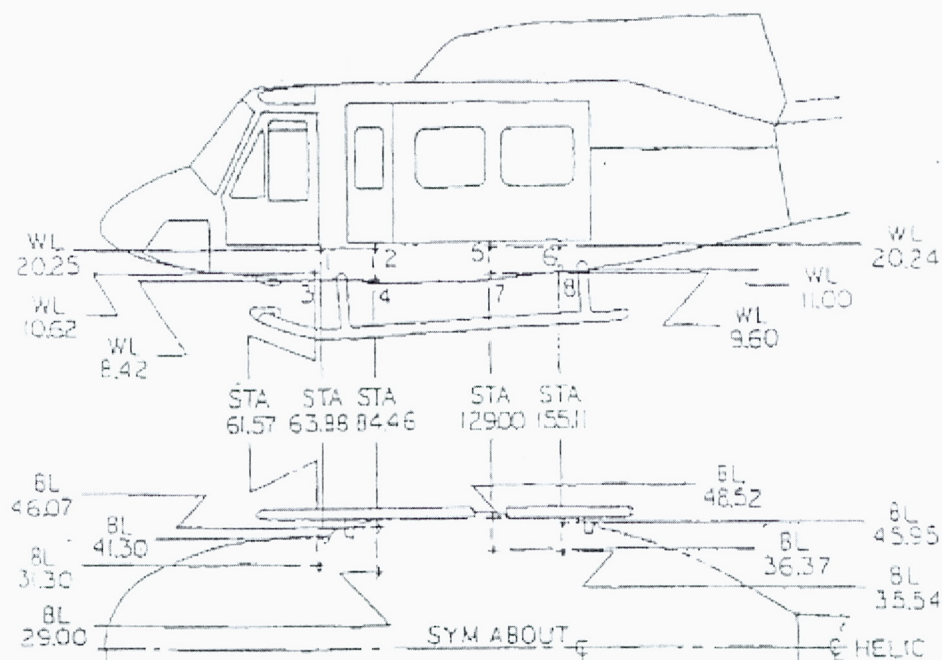
DESCRIPTION:

1. There are sixteen external load carrying hard point fittings (eight to a side) on the 205A/205A-1 helicopter. One pair of the fittings are located at each of the fuselage stations 61, 84 and 135. Two (2) sets of the aft hard point fittings are removed from fuselage station 129 due to the passenger step installation. These predrilled fittings are located in the loose equipment or stowed under the cabin floor on the left hand and right hand access door assemblies, P/N 205-032-142 -39 and -40. When they are required, it will be necessary to remove the passenger steps to install these fittings.
2. These fittings are designed for the following limit loads acting simultaneously. Upper hard points vertical 3060 pounds, side (lateral) 1310 pounds; lower hard points vertical 1560 pounds, side (lateral) 1310 pounds.
3. In addition to the above loads, each fitting is designed to a limit forward or aft load of 1700 pounds.
4. In order to assist the customer in attaching external loads, Bell Helicopter has an external stores support kit P/N 205-706-013-11 available through the Spares Department.

ENGINEERING *Joe R. Beebe*
DO NOT REMOVE FROM THIS OFFICE
Wm. J. Diehl
Manager Service

EXTERNAL HARDPOINTS: MODELS 205, 212, 214B & 412

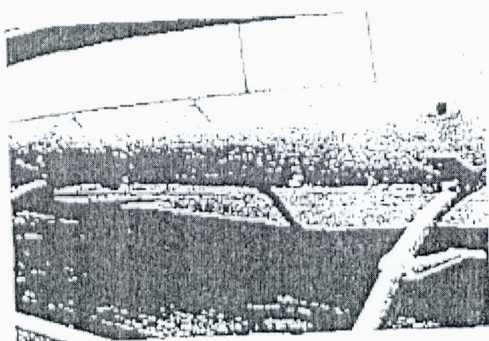
FUSELAGE LOCATIONS AND ALLOWABLE ULTIMATE LOADS



CAUTION: Helicopter C.G. limits must be maintained for all equipment or stores configurations which attach to any or all of these hard-points.



Provisions to attach special equipment externally on the lower fuselage are provided as part of the basic airframe. Nine hard point fittings are mounted on each side. The most forward hard point is part of the jacking/mooring point. Four fittings make up the forward cluster and four make up the aft cluster.



Each cluster is designed to carry a load of 340 kilograms, 750 pounds, with the center of gravity between the pairs and about 38 centimeters, 15 inches outboard of the widest part of the fuselage.

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA 751.90

QUICK RELEASE CARGO BASKET

CHANGED → ALLOW RAR
L/R SIDE INST.

Preface

These Instructions for Continued Airworthiness shall be included in the rotorcraft Maintenance Manual when the Quick Release Cargo Basket assembled in accordance with AERO Design Ltd. Document Control List DCL751-2, Revision 0, and DCL751-3, Revision 0, or later approved revision, is installed.

The information contained herein supplements the information in the basic Maintenance Manual. For Maintenance practices and procedures not contained in these Instructions for Continued Airworthiness refer to the basic Maintenance Manual and its approved supplements.

Revision 0
Date: 6 September, 2007

AERO Design Ltd.
Engineering Consultants

2013 – 39th Avenue N.E., Calgary, Alberta T2E 6R7
Phone: (403) 250-8027
Fax: (403) 250-8333
E-Mail: infor@aerodesign.ca

Notice: This report contains information and data which is proprietary to AERO Design Ltd. This report, or any portion thereof, may not be reproduced, copied, duplicated or used without the written consent of AERO Design Ltd.

RECORD OF REVISIONS

Revision Number	Issue Date	Date Inserted	By
0			Original Issue

LIST OF EFFECTIVE PAGES

List of Revisions

Revision 0 (Original Issue) 6 September, 2007

List of Effective Pages

<u>Description</u>	<u>Pages</u>	<u>Revision No.</u>
Cover	1	0
Revision Record/List of Effective Pages	2	0
Table of Contents	3	0
00-00-00	4-5	0
04-00-00	6	0
05-00-00	7-9	0
11-00-00	10	0
25-50-00	11-13	0

TABLE OF CONTENTS

RECORD OF REVISIONS	2
LIST OF EFFECTIVE PAGES	2
CHAPTER 0 – INTRODUCTION	4
0-1 SCOPE	4
0-2 DEFINITIONS AND ABBREVIATIONS	4
0-3 DISTRIBUTION	4
0-4 COMPATIBILITY	4
0-5 GENERAL DESCRIPTION	5
CHAPTER 4 - AIRWORTHINESS LIMITATIONS	6
CHAPTER 5 – INSPECTION REQUIREMENTS	7
5-1 INSPECTION SCHEDULE	7
5-2 DAMAGE LIMITS / REPAIR INSTRUCTIONS	8
5-3 PROTECTIVE TREATMENT INFORMATION	9
CHAPTER 11 – MARKINGS AND PLACARDS	10
CHAPTER 25 – EQUIPMENT AND FURNISHINGS	11
SECTION 50 – CARGO COMPARTMENTS	11
25-1 BEAMS INSTALLATION	11
25-2 BEAMS REMOVAL	11
25-3 BASKET INSTALLATION	12
25-4 BASKET REMOVAL	12
25-5 WEIGHT AND BALANCE	13
25-6 STRUCTURAL FASTENER DATA	13

CHAPTER 0 – INTRODUCTION

0-1 SCOPE

The following Instructions for Continued Airworthiness (ICA) satisfy the requirements of 14 CFR 29.1529, and provide the information necessary to complete the on-going maintenance and inspections required for rotorcraft embodying the Quick Release Cargo Basket as described herein.

0-2 DEFINITIONS AND ABBREVIATIONS

ICA - Instructions for Continued Airworthiness
LH - Left Hand
RH - Right Hand

0-3 DISTRIBUTION

Copies of this ICA and amendments shall be distributed to all known purchasers of the Quick Release Cargo Basket. Requests for a copy may be made in writing to:

AERO Design Ltd.
2013 39th Avenue N.E.
Calgary, Alberta
T2E 6R7
Fax: 403-250-8333
Email: info@aerodesign.ca

Any changes will be sent to Transport Canada. All changes will be recorded in the Record of Revisions page at the front of this document.

0-4 COMPATIBILITY

Prior to incorporating this modification, the installer shall establish that the inter-relationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the helicopter.

0-5 GENERAL DESCRIPTION

The cargo basket installation is a metal mesh basket installed to the side of the helicopter on beams attached to existing hard points under the main cabin door. The quick release basket allows for the installation and removal of the basket without tools, allowing a pilot operating in the field without maintenance support to install or remove the basket, leaving the mounting beams in place.

The basket itself is 72" long, 22.5" wide, and 17" high. It is made of a steel welded tubing structure, and lined with expanded steel mesh. The basket has a hinged lid with a self-locking handle.

The beams consist of a machined aluminum section to attach to the hard points, with a steel tube bolted to the outboard face. The quick release mechanism is built into the steel tube.

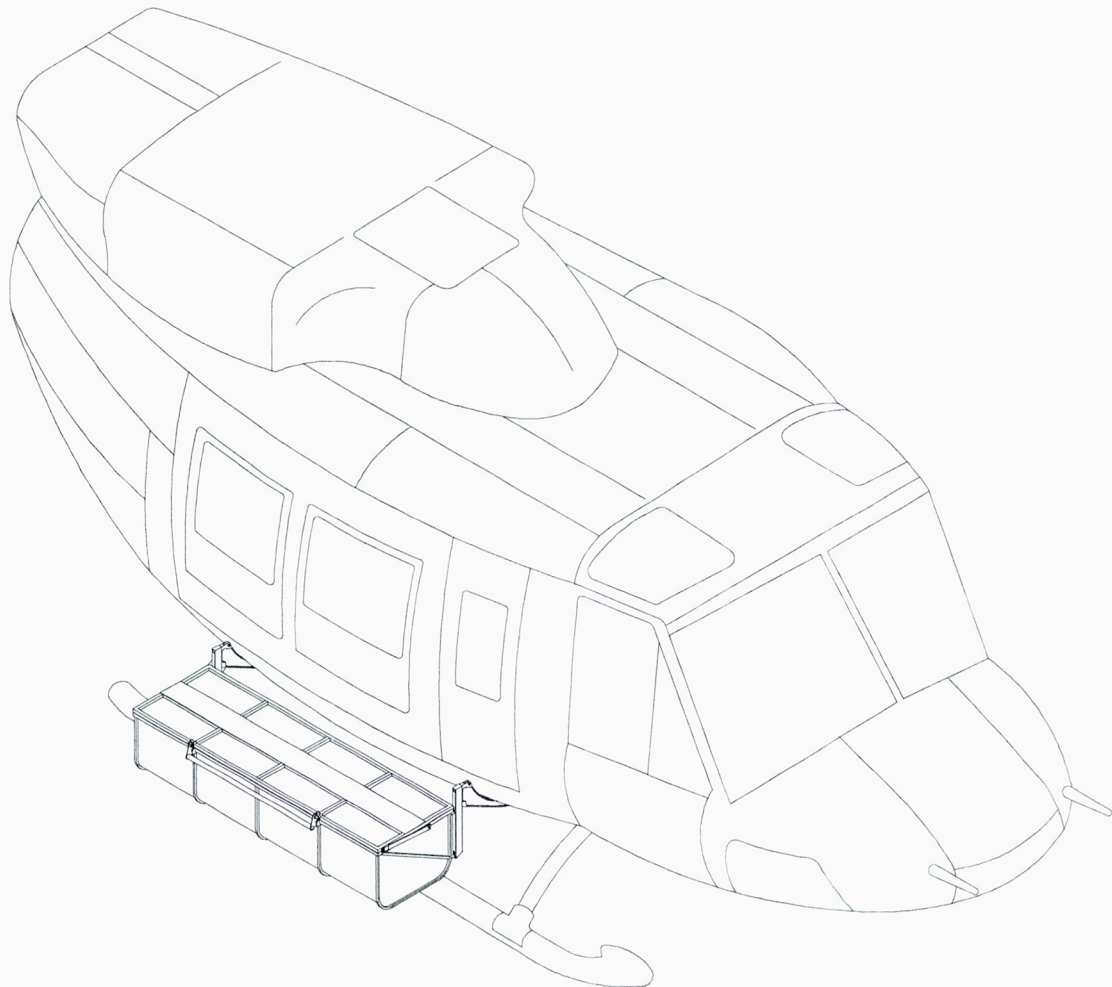


Figure 1 – Cargo Basket Installation

CHAPTER 4 - AIRWORTHINESS LIMITATIONS

The Airworthiness Limitations section is Transport Canada-approved and specifies maintenance required under Section 571 of the Canadian Aviation Regulations, unless an alternative program has been approved.

No additional airworthiness limitations have been imposed due the installation of the Quick Release Cargo Basket.

CHAPTER 5 – INSPECTION REQUIREMENTS

5-1 INSPECTION SCHEDULE

Continued airworthiness is contingent upon compliance with the following inspection items. These items shall be completed in conjunction with the rotorcraft Maintenance Inspection schedule, or other approved program, or upon removal and replacement of any component of Quick Release Cargo Basket.

Daily Inspection

1. Inspection Area: Basket
 - a) Inspect the basket attachment to the beams for condition and security. Ensure quick release mechanism is completely extended, flush with the outboard surface of the beam.
 - b) Inspect latching of the lid for correct operation. If basket is bent inward the lid will close but may not latch.

300 Hour or Annual Inspection

1. Inspection Area: Basket
 - a) Visually inspect tube-to-tube welds and mesh-to-tube welds for cracks, corrosion or other damage.
 - b) Visually inspect basket mesh for damage.
2. Inspection Area: Beams

With the basket removed:

 - a) Visually inspect beams attaching basket to the helicopter for cracks, corrosion or other damage.
 - b) Visually inspect the AN5 bolts attaching the steel tube to aluminum beam for condition and security.
 - c) Visually inspect lugs attaching the basket to the beams for security and damage.
 - d) Visually inspect bolts attaching beams to helicopter hard points for condition and security.

Special Inspections

Following a hard landing inspect the Quick Release Cargo Basket installation in accordance with the 300 hour or annual inspection listed above.

5-2 DAMAGE LIMITS / REPAIR INSTRUCTIONS

If damage is found in the inspections above, repair in accordance with the instructions below.

1. Basket

- a) Repair Basket in accordance with AC43.13-1B, Chapter 4, Section 5, Welding, as required.
- b) Basket is fabricated from the following materials:
 - Lid and Rim: $\frac{3}{4}$ " square steel tube
 - Frames: $\frac{1}{2}$ " square steel tube
 - Mesh: $\frac{3}{4}$ " 16 ga. (0.040") expanded steel mesh
- c) Touch up with polyurethane paint as required following repairs.

2. Steel Beams

DO NOT REPAIR DAMAGE TO BEAMS IF BEYOND THE LIMITS BELOW.

- a) Nicks and/or gouges on the outboard face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour.
- b) Nicks and/or gouges on the side and inboard faces up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- c) Critical keyway dimensions are shown in Figure 3. Attempt to insert 27/64 drill shank into bottom end of keyway. If drill can be inserted, slot is worn beyond limit.



Figure 3 – Keyway dimensions

- d) Touch up with polyurethane paint as required following repairs.

3. Aluminum Beams

DO NOT REPAIR DAMAGE TO BEAMS IF BEYOND THE LIMITS BELOW.

- a) Nicks and/or gouges on the top or bottom face up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- b) Nicks and/or gouges on the flanges up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- c) Nicks and/or gouges on the web up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour.
- d) Touch up with polyurethane paint as required following repairs.

5-3 PROTECTIVE TREATMENT INFORMATION

1. Beams

The steel tube is supplied powder coated white, the aluminum beam is painted white. If the powder coat or paint is damaged, touch up with white polyurethane paint.

2. Cargo Basket

The cargo basket is supplied powder coated white. If the powder coat is damaged, touch up with white polyurethane paint.

CHAPTER 11 – MARKINGS AND PLACARDS

The following markings and placards are used with the Quick Release Cargo Basket Installation in the locations noted:

- a) Located on basket lid:



CHAPTER 25 – EQUIPMENT AND FURNISHINGS

SECTION 50 – CARGO COMPARTMENTS

25-1 BEAMS INSTALLATION

Refer to Figure 4.

1. Ensure hard points at FS 84.46 and FS155.11 are fitted with bushings, in accordance with the original configuration of the helicopter. Bushings must be pressed flush with the surface of the lug.
2. Locate 75115-01 Forward Beam Assembly on hard points at FS 84.45. Install two AN5-12A Bolts, AN960-516 Washers (2 per bolt) and MS21044N5 nuts. Torque AN5 bolts to 100-140 in-lbs.
3. Locate 75116-01 Aft Beam Assembly on hard points at FS 155.11. Install two AN4-12A Bolts, AN960-416 Washers (2 per bolt), and MS21044N4 Nuts. Torque AN4 bolts to 50-70 in-lbs.

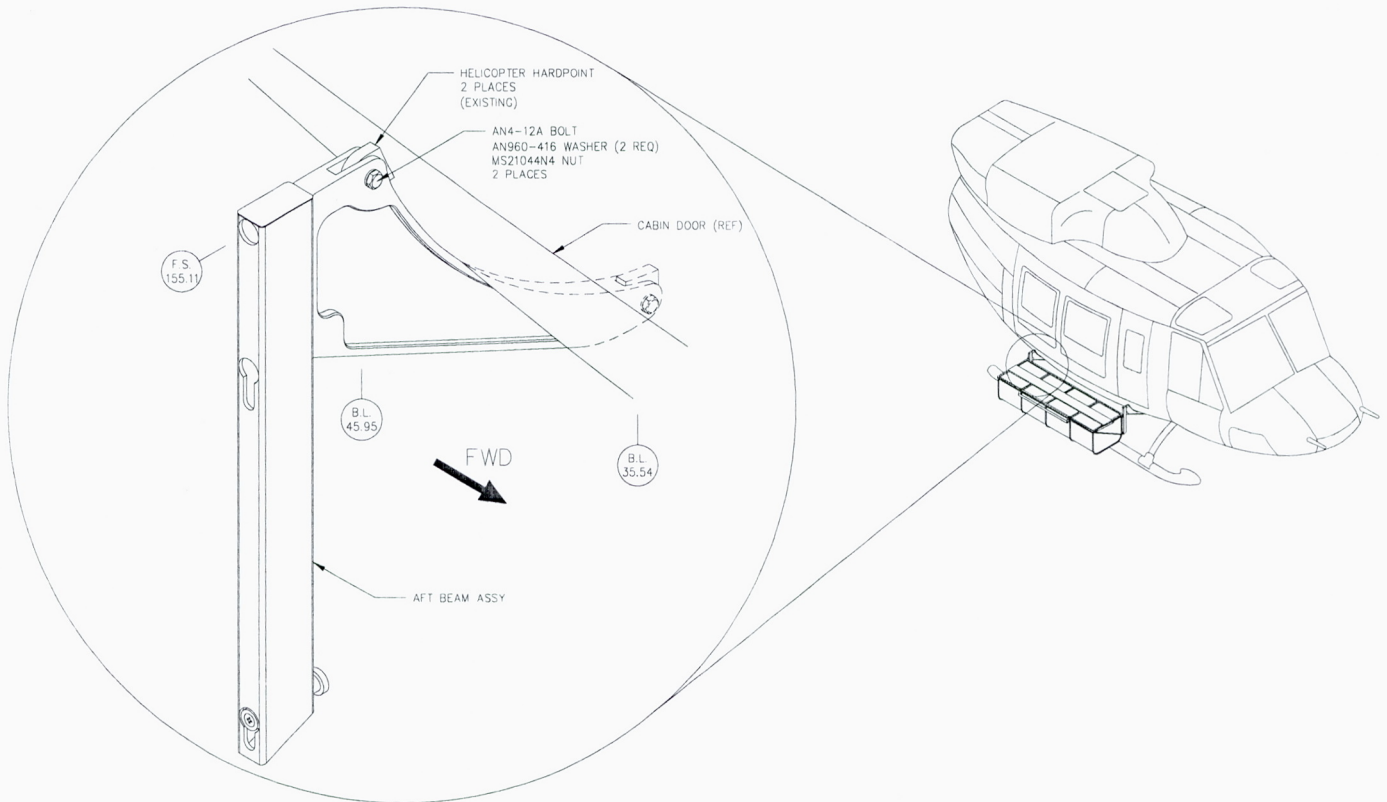


Figure 4 – Beam Installation

25-2 BEAMS REMOVAL

Refer to Figure 4.

1. Remove Cargo Basket. Refer to section 25-4.
2. Remove two AN5-12A Bolts, AN960-516 Washers and MS21044N5 Nuts from 75115-01 Forward Beam Assembly. Remove Forward Beam.

3. Remove two AN4-12A Bolts, AN960-616 Washers and MS21044N4 Nuts from 75116-01 Aft Beam Assembly. Remove Aft Beam.

25-3 BASKET INSTALLATION

Refer to Figure 5.

1. Set basket upper attachment into upper keyway in forward and aft beams.
2. At forward end of basket, lift basket until lower attachment fitting hits stop. Push fitting into keyway and slide basket down until locked.
3. Repeat step 2 for aft end.

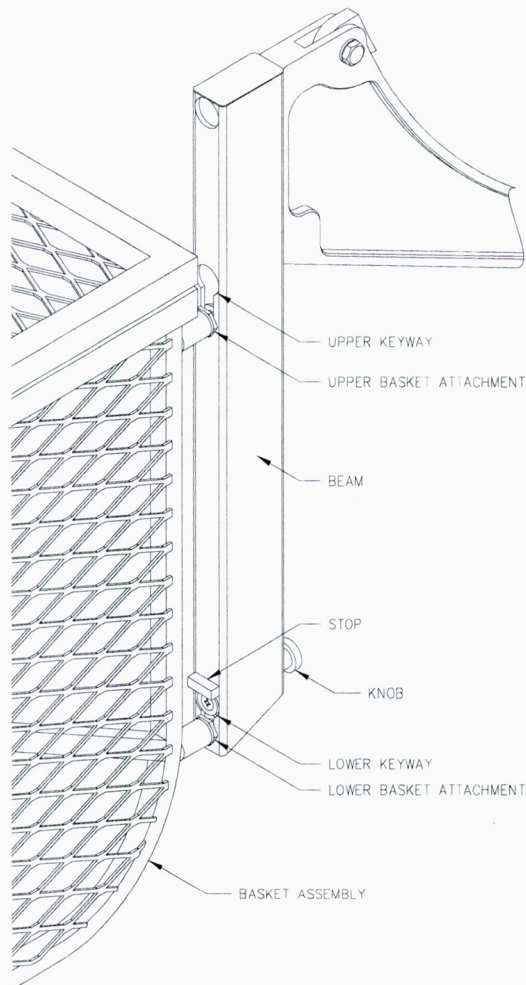


Figure 5 – Basket Attachment

25-4 BASKET REMOVAL

Refer to Figure 5.

1. Pull knob at bottom end of forward beam and lift basket until lower attachment fitting is free of keyway. Keep upper basket attachment in keyway on beam.

2. Pull knob at bottom end of aft beam and lift basket until lower attachment fitting is free of keyway. Keep upper basket attachment in keyway on beam.
3. Lift basket until upper attachments are out of keyways on both beams and remove basket from helicopter.

25-5 WEIGHT AND BALANCE

Two weight and balance configurations are required for the pilot. The first is the complete installation of Beams only. The second is Cargo Basket and Beams as the basket may be removed/installed in the field by the pilot.

Configuration 1 – Beams Only		Weight (lbs)	Longitudinal		Lateral	
Part #	Name		Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
75115-01	Forward Beam Assembly	5.0	84.5	422.5	46.0	230.0
75116-01	Aft Beam Assembly	4.6	155.1	713.5	47.3	217.6
Total		9.6	118.3	1136.0	46.6	447.6

Configuration 2 – Basket and Beams		Weight (lbs)	Longitudinal		Lateral	
Part #	Name		Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
75115-01	Forward Beam Assembly	5.0	84.5	422.5	46.0	230.0
75116-01	Aft Beam Assembly	4.6	155.1	713.5	47.3	217.6
75110-01	Cargo Basket	49.5	119.5	5915.3	62.2	3078.9
Total		59.1	119.3	7051.3	59.7	3526.5

25-6 STRUCTURAL FASTENER DATA

Refer to Bell Standard Practices Manual BHT-ALL-SPM for torque values not listed in this ICA.

AERO Design Ltd.

**TEST REPORT
TR751.02**

QUICK RELEASE CARGO BASKET

Bell 205A-1, 212, 412

Approved: E. Burgoin, P. Eng.

Prepared by: Jeff Clarke

Revision 0
Date: 31 August, 2007

AERO Design Ltd.
Engineering Consultants

2013 – 39th Avenue N.E., Calgary, Alberta T2E 6R7
Phone: (403) 250-8027
Fax: (403) 250-8333
E-Mail: info@aerodesign.ca

Notice: This report contains information and data which is proprietary to **AERO** Design Ltd. This report, or any portion thereof, may not be reproduced, copied, duplicated or used without the written consent of **AERO** Design Ltd.

TABLE OF CONTENTS

1.0	INTRODUCTION	3
2.0	REFERENCE	3
3.0	LOADS	4
5.1	Inertia Loads	5
5.2	Drag Load	6
4.0	LOAD TESTS	7
4.1	Positive Maneuvering Condition	7
4.1.1	Limit Load	7
4.1.2	Ultimate Load	8
4.2	Negative Maneuvering Condition	11

1.0 INTRODUCTION

This report is to demonstrate structural compliance for the Bell 205A-1/212/412 quick release cargo basket. The tests are limited to the basket and steel beam part of the installation.

2.0 REFERENCE

AERO Design Ltd. Engineering Report ER751.01

3.0 LOADS

Reference ER751.01.

BELL 412 HELICOPTER LOAD FACTORS, FAR 29:

FAR 29.561(b)(3)

Ultimate Upward Emergency Landing Load Factor:	$n_{e_up} := 1.5$
Ultimate Forward Emergency Landing Load Factor:	$n_{e_fwd} := 4.0$
Ultimate Sideward Emergency Landing Load Factor:	$n_{e_side} := 2.0$
Ultimate Downward Emergency Landing Load Factor:	$n_{e_down} := 4.0$

FAR 29.625 Fitting Factor (does not apply to articles being tested): $n_{ff} := 1.15$

FAR 29.303 Safety Factor: $n_{sf} := 1.5$

FAR 29.337(a)

	Limit Positive Manouvering Load Factor:	$n_{man} := 3.5$
$n_{man_ult} := n_{man} \cdot n_{sf}$	Ultimate Positive Manouvering Load Factor:	$n_{man_ult} = 5.25$
	Limit Negative Manouvering Load Factor:	$n_{man_neg} := -1.0$
$n_{man_neg_u} := n_{man_neg} \cdot n_{sf}$	Ultimate Negative Manouvering Load Factor:	$n_{man_neg_u} = -1.5$

CRITICAL ULTIMATE LOAD FACTORS:

Downward:	Ultimate Positive Manouvering Load Factor:	$n_{man_ult} = 5.25$
Forward:	Ultimate Forward Emergency Landing Load Factor:	$n_{e_fwd} = 4$
Sideward:	Ultimate Sideward Emergency Landing Load Factor:	$n_{e_side} = 2$
Upward:	Ultimate Upward Emergency Landing Load Factor:	$n_{e_up} = 1.5$

Note: The basket is mounted below and to one side of the cabin. Forward deflection or failure in the emergency landing condition does not endanger the occupants. Likewise, Sideward and Upward deflection or failure of the basket in the emergency landing condition do not endanger the occupants.

Sideward and Upward Load Factors are used in the tests to ensure that the lid of the basket does not open in flight.

5.1 Inertia Loads

Quick Release Cargo Basket

$$W_{\text{basket}} := 55 \text{ lbf}$$

Weight of basket

$$W_{\text{cargo}} := 300 \text{ lbf}$$

Weight of cargo (max)

$$W_{\text{beam}} := 3 \cdot \text{lbf}$$

Weight of beam (each)

$$P_{\text{basket}} := W_{\text{basket}} + W_{\text{cargo}}$$

$$P_{\text{basket}} = 355 \text{ lbf}$$

Combined weight of basket and cargo

$$P_{\text{lim_man}} := P_{\text{basket}} \cdot n_{\text{man}}$$

$$P_{\text{lim_man}} = 1242.5 \text{ lbf}$$

Limit maneuvering load

$$P_{\text{ult_man}} := P_{\text{basket}} \cdot n_{\text{man_ult}}$$

$$P_{\text{ult_man}} = 1863.8 \text{ lbf}$$

Ultimate maneuvering load

$$P_{\text{lim_beam}} := W_{\text{beam}} \cdot n_{\text{man}}$$

$$P_{\text{lim_beam}} = 10.5 \text{ lbf}$$

Limit load due to weight of beam

$$P_{\text{ult_beam}} := P_{\text{lim_beam}} \cdot n_{\text{sf}}$$

$$P_{\text{ult_beam}} = 15.8 \text{ lbf}$$

Ultimate load due to weight of beam

$$P_{\text{lim_cargo_neg}} := W_{\text{cargo}} \cdot n_{\text{man_neg}}$$

$$P_{\text{lim_cargo_neg}} = -300 \text{ lbf}$$

Limit negative maneuvering load due to cargo

$$P_{\text{ult_cargo_neg}} := W_{\text{cargo}} \cdot n_{\text{man_neg_u}}$$

$$P_{\text{ult_cargo_neg}} = -450 \text{ lbf}$$

Ultimate negative maneuvering load due to cargo

5.2 Drag Load

$$l_{\text{basket}} := 72 \cdot \text{in}$$

Length of basket.

$$w_{\text{basket}} := 22 \cdot \text{in}$$

Width of basket.

$$h_{\text{basket}} := 17 \cdot \text{in}$$

Height of basket.

$$A_f := w_{\text{basket}} \cdot h_{\text{basket}}$$

$$A_f = 374 \text{in}^2$$

Frontal Area of basket.

$$A_p := l_{\text{basket}} \cdot w_{\text{basket}}$$

$$A_p = 1584 \text{in}^2$$

Planar Area of basket.

$$\frac{l_{\text{basket}}}{w_{\text{basket}}} = 3.3$$

Fineness ratio of basket

$$C_{D0} := 1.6$$

Drag Coefficient of Basket, (overestimated)
(Ref. Hoerner, Fluid Dynamic Drag, Figure 22).

$$\rho := 0.002378 \frac{\text{slug}}{\text{ft}^3}$$

Density of air at Sea Level.

$$V_{\text{ne}} := 140 \text{knots}$$

Never-Exceed-Speed of Bell 412.
(Ref. Bell 412 Flight Manual.)
(Highest of 205A-1, 212 and 412)

$$V_d := \frac{V_{\text{ne}}}{0.9}$$

$$V_d = 156 \text{knots}$$

Design Dive Speed of Bell 412

$$\text{Drag} := \frac{\rho}{2} \cdot V_d^2 \cdot A_f \cdot C_{D0}$$

$$\text{Drag} = 341 \text{lbf}$$

Limt Drag on basket.

$$\text{Drag}_{\text{ult}} := \text{Drag} \cdot n_{\text{sf}}$$

$$\text{Drag}_{\text{ult}} = 511 \text{lbf}$$

Ultimate Drag load on basket

$$AC_{\text{drag}} := 60.3 \cdot \text{in}$$

Lateral Aerodynamic Center of basket.

4.0 LOAD TESTS

To test the basket and steel beams, a jig was fabricated to mount the basket as it would be installed on the helicopter. Two threaded lugs were welded to the top of a large I beam. The steel beams were bolted to the lugs with AN5 bolts, and a support bar was inserted at the lower attachments. This simulates the helicopter installation because the top attachment is in tension and bottom in compression.

4.1 Positive Maneuvering Condition

4.1.1 Limit Load

The basket weight applies 1g down, so it can be subtracted from the required load.

Limit maneuvering load in test = 1242.5 lbs – 55 lbs = 1187.5 lbs

Limit drag in test = 341 lbs

The basket was loaded with 1200 lbs of lead shot (48 bags), evenly distributed over the bottom. The drag load was applied simultaneously by pulling on the aft frame of the basket with a chain connected to a come-along and a load cell.

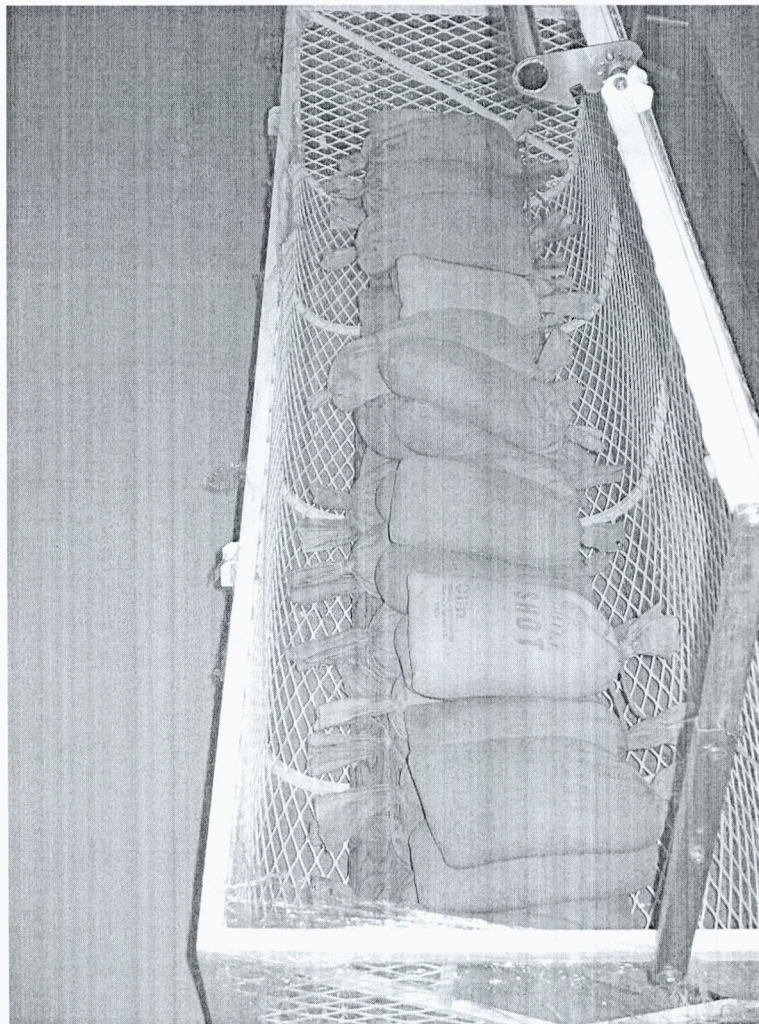


Figure 4.1.1 – Limit Maneuvering Load

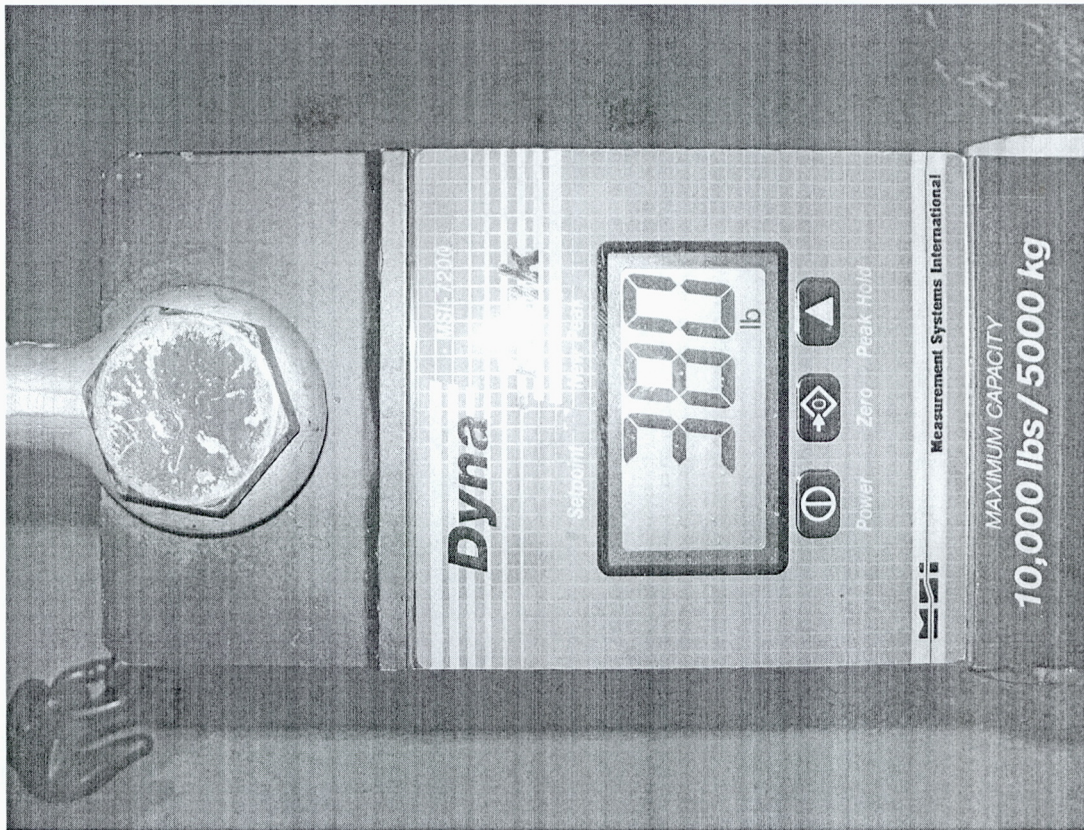


Figure 4.1.2 – Limit Drag Load Applied

Deflections under load were small. Once the loads were removed, there were no signs of permanent deformation.

The maneuvering and drag loads applied exceed the limit conditions.

4.1.2 Ultimate Load

The basket weight applies 1g down, so it can be subtracted from the required load.

Ultimate maneuvering load in test = 1863.8 lbs – 55 lbs = 1808.8 lbs

Ultimate drag in test = 341 lbs

The basket was loaded with 1825 lbs of lead shot (73 bags), evenly distributed over the bottom. The drag load was applied simultaneously by pulling on the aft frame of the basket with a chain connected to a come-along and a load cell.

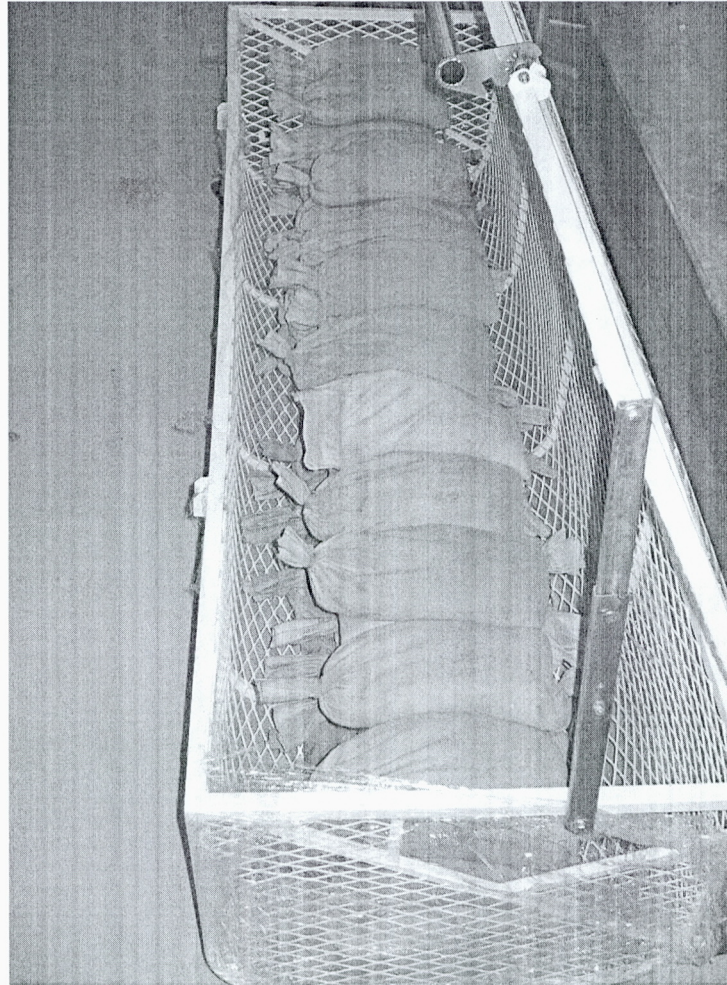


Figure 4.1.3 – Ultimate Maneuvering Load



Figure 4.1.4 – Ultimate Drag Load

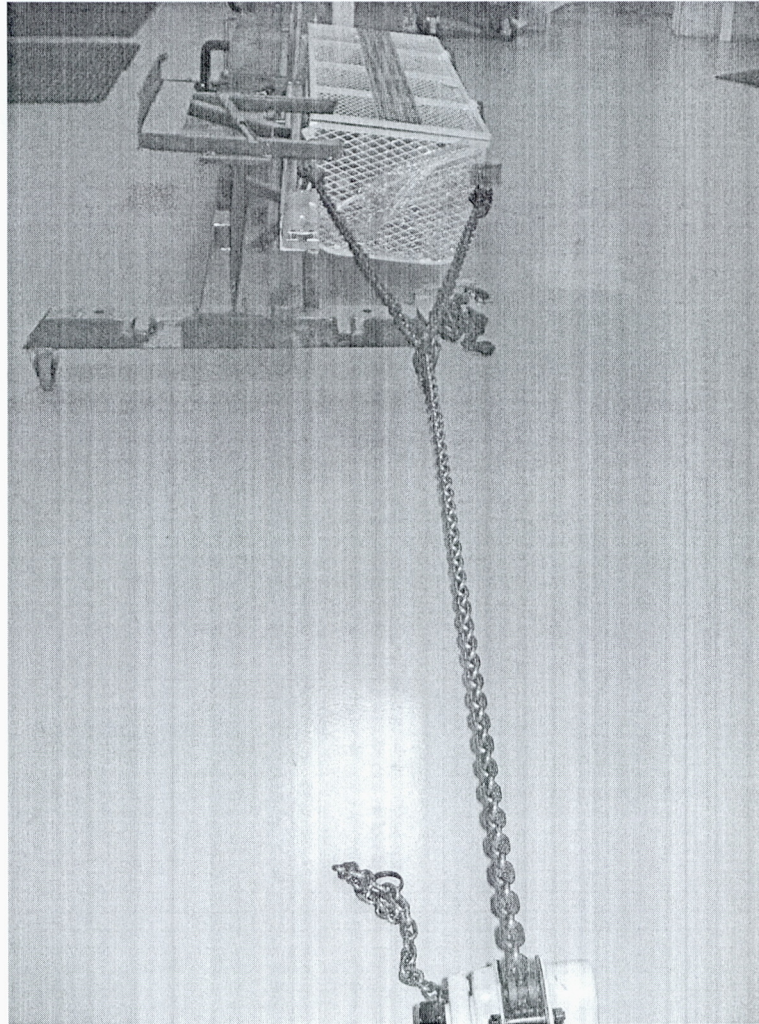


Figure 4.1.5 – Drag Load Application

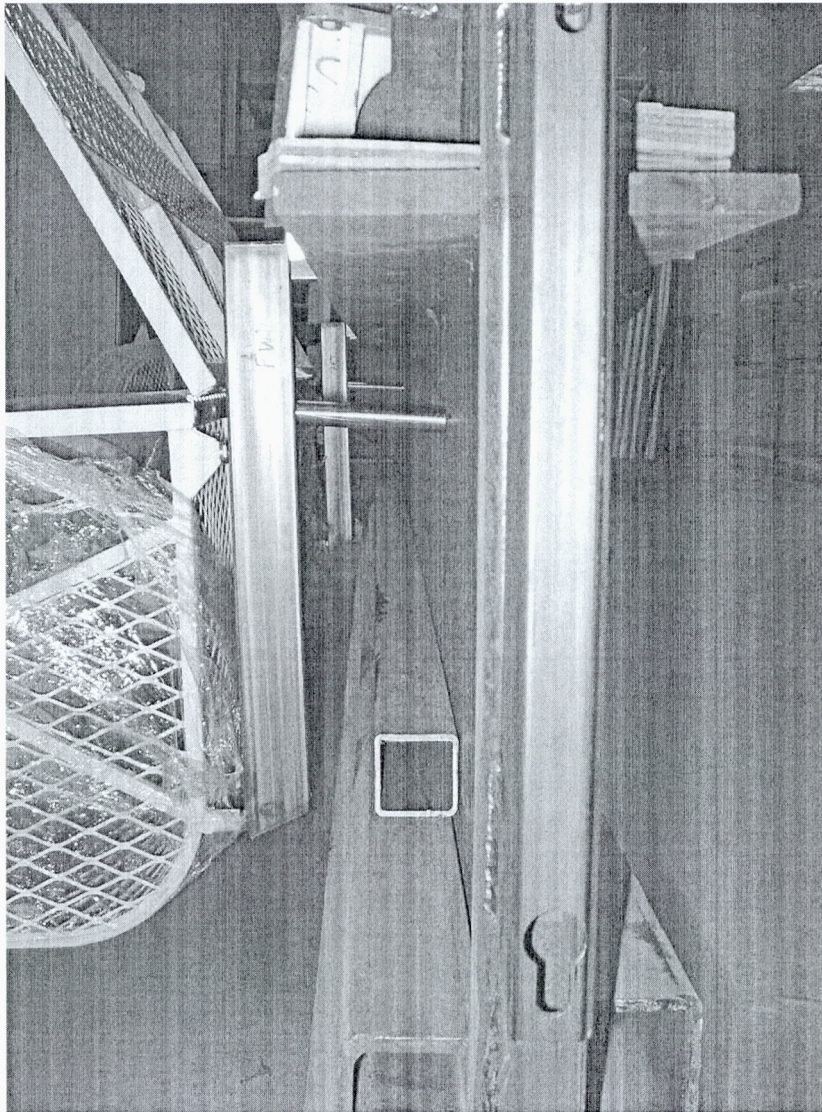


Figure 4.1.6 – Deflection at Ultimate Load

Once the loads were removed, there was no sign of permanent deformation. The basket lid was positively latched while loaded.

The maneuvering and drag loads applied exceed the ultimate conditions.

The basket and steel beams are acceptable for use with 300 lbs of cargo in the basket.

4.2 Negative Maneuvering Condition

The lid must contain cargo under the negative maneuvering condition. This basket is placarded to carry 300 lbs.

The basket was mounted upside down on the test jig used above. The lid was loaded with 450 lbs of lead shot (18 bags) and then lifted closed.

The lid and the handle latches supported the load. The basket is acceptable for use with 300 lbs of cargo.

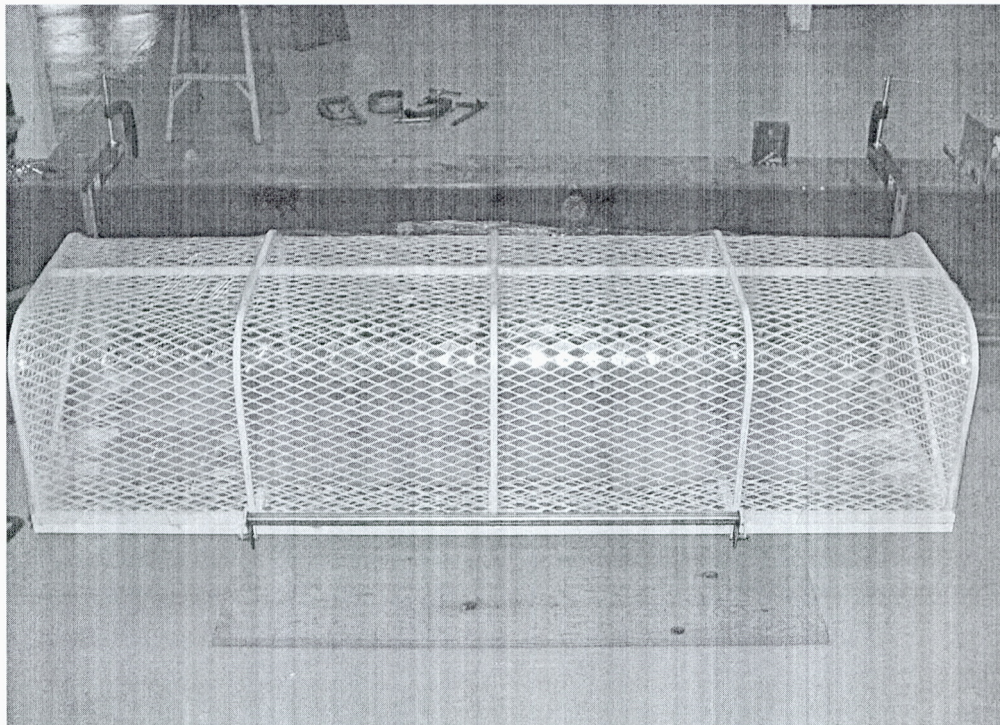


Figure 4.2.1 – Load on Lid

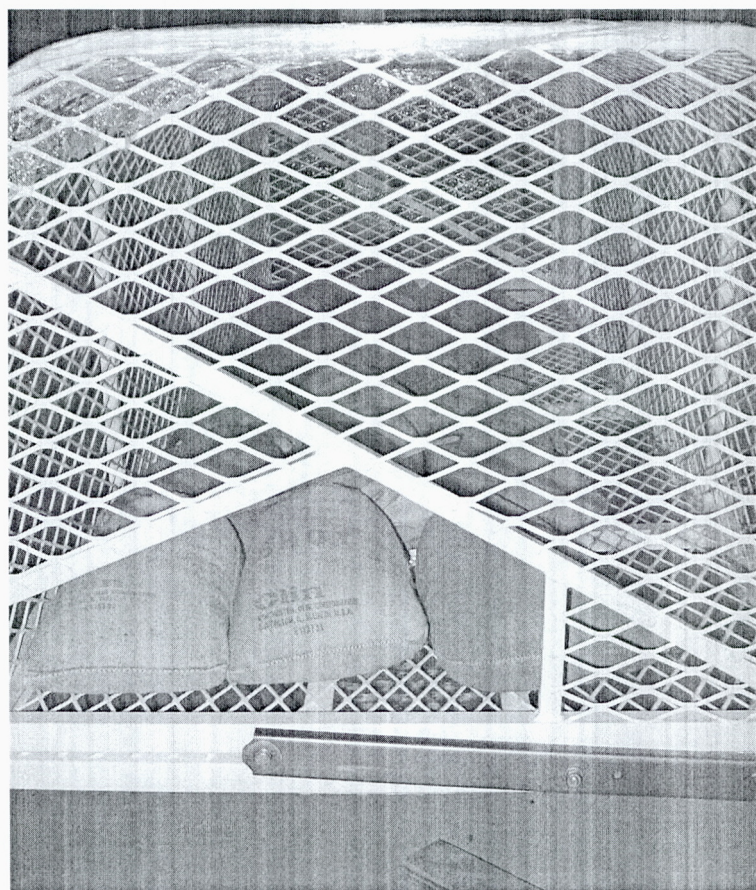


Fig 4.2.2 – Load on Lid (End View)

APPENDIX A-3 NORMAL CATEGORY ROTORCRAFT – CAR 529

BLOCK 1

Name of the applicant for the design change approval:	Aero Design Ltd.
Description of the design change:	Installation of Quick Release Cargo Basket on Bell 205A-1/212/412
Certification Basis of design change and revision date:	FAR 29, Amendment 29-2
CAR Standard A529.1(c) Program showing how changes to supplemental ICA made by the applicant or by the manufacturers of products and appliances installed in the aeroplane pursuant to the design change will be distributed:	Section 0-3 of Supplemental ICA (ICA 751.90)
CAR Standard 513.05 (1) (g) (iv): Installation Instructions:	Installation Drawing 75101

BLOCK 2

Note: Enter "N/A" when no supplemental ICA are needed.

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A529.2 (a) Manual(s) (a) The Instructions for Continued Airworthiness must be in the form of a manual or manuals as appropriate for the quantity of data to be provided.	ICA ref: Bell 205A-1/212/412 Maintenance Manuals, BHT-205A1-MM-1 BHT-212-MM BHT-412-MM	Supplemental ICA ref: Single Manual (ICA751.90)
A529.2 (b) Practical arrangement (b) The format of the manual or manuals must provide for a practical arrangement.	ICA ref: Bell 205A-1/212/412 Maintenance Manual	Supplemental ICA ref: Arranged in ATA format
A529.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A529.3 (a) Rotorcraft maintenance manual or section		
A529.3 (a) (1) (Introduction) (1) Introduction information that includes an explanation of the rotorcraft's features and data to the extent necessary for maintenance or preventive maintenance.	ICA ref: Bell 205A-1/212/412 Maintenance Manual, Chapter 1	Supplemental ICA ref: Section 0-1

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A529.3 (a) (2) (Description) (2) A description of the rotorcraft and its systems and installations including its engines, rotors, and appliances.	ICA ref: Bell 205A-1/212/412 Maintenance Manual, Chapter 1	Supplemental ICA ref: Section 0-5
A529.3 (a) (3) Control & Operation (3) Basic control and operation information describing how the rotorcraft components and systems are controlled and how they operate, including any special procedures and limitations that apply.	ICA ref: N/A	Supplemental ICA ref: N/A
A529.3 (a) (4) Servicing (4) Servicing information that covers details regarding servicing points, capacities of tanks, reservoirs, types of fluids to be used, pressures applicable to the various systems, location of access panels for inspection and servicing, locations of lubrication points, lubricants to be used, equipment required for servicing, tow instructions and limitations, mooring, jacking, and levelling information.	ICA ref: Bell 205A-1/212/412 Maintenance Manual, Chapter 12	Supplemental ICA ref: N/A
A529.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A529.3 (b) Maintenance Instructions.		
A529.3 (b) (1) Scheduling 1) Scheduling information for each part of the rotorcraft and its engines, auxiliary power units, rotors, accessories, instruments, and equipment that provides the recommended periods at which they should be cleaned, inspected, adjusted, tested, and lubricated, and the degree of inspection, the applicable wear tolerances, and work recommended at these periods. However, the applicant may refer to an accessory, instrument, or equipment manufacturer as the source of this information if the applicant shows that the item has an exceptionally high degree of complexity requiring specialized maintenance techniques, test equipment, or expertise. The recommended overhaul periods and necessary cross-references to the Airworthiness Limitations section of the manual must also be included. In addition, the applicant must include an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the rotorcraft.	ICA ref: Bell 205A-1/212/412 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A529.3 (b) (2) Troubleshooting (2) Troubleshooting information describing probable malfunctions, how to recognize those malfunctions, and the remedial action for those malfunctions.	ICA ref: N/A	Supplemental ICA ref: N/A
A529.3 (b) (3) Removal/replacement (3) Information describing the order and method of removing and replacing products and parts with any necessary precautions to be taken.	ICA ref: Bell 205A-1/212/412 Maintenance Manual, Chapter 25	Supplemental ICA ref: Section 25-1 thru 25-4
A529.3 (b) (4) General (4) Other general procedural instructions including procedures for system testing during ground running, symmetry checks, weighing and determining the center of gravity, lifting and shoring, and storage limitations.	ICA ref: Bell 205A-1/212/412 Maintenance Manual, Chapter 7 and 8	Supplemental ICA ref: Section 25-5
A529.3 (c) Access (c) Diagrams of structural access plates and information needed to gain access for inspections when access plates are not provided.	ICA ref: N/A	Supplemental ICA ref: N/A
A529.3 (d) Special inspections (d) Details for the application of special inspection techniques including radiographic and ultrasonic testing where such processes are specified.	ICA ref: Bell 205A-1/212/412 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1
A529.3 (e) Protective treatment (e) Information needed to apply protective treatments to the structure after inspection.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 3	Supplemental ICA ref: Section 5-3
A529.3 (f) Fasteners, torque values, etc (f) All data relative to structural fasteners such as identification, discard recommendations, and torque values.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 2	Supplemental ICA ref: Section 25-6
A529.3 (g) Special tools (g) A list of special tools needed.	ICA ref: N/A	Supplemental ICA ref: N/A

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

BLOCK 3

Note: The statement in block 5 does not constitute an approval of the Airworthiness Limitations Section. Airworthiness Limitations differ from other maintenance tasks, in that they are mandatory, as a direct condition of the approval of the type design. They are therefore referenced directly in the approval document itself. However, they must also be included in the Supplemental Instructions for Continued Airworthiness.

A529.4 AWL - Separate Section 1

The Instructions for Continued Airworthiness must contain a section titled Airworthiness Limitations that is segregated and clearly distinguishable from the rest of the document. This section must set forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure approved under 529.571. If the Instructions for Continued Airworthiness consist of multiple documents, the section required by this paragraph must be included in the principal manual. This section must contain a legible statement in a prominent location that reads: "The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister."

ICA ref: Bell 205A-1/212/412
Maintenance Manual, Chapter 4

Supplemental ICA ref: Chapter 4

BLOCK 4 – Applicant Statement of Compliance

The Supplemental ICA referenced above comprises the complete listing of supplemental ICA necessary to show compliance with the regulatory standard that supports this change in type design.

Applicants Signature: _____

Date: _____

26 Nov 2007

Applicants Name: _____ E. Burgoin, P.Eng. DAR 290M

BLOCK 5 – Minister's Statement of Acceptability

The design change is adequately supported by existing ICA and/or supplemental ICA, as identified above and is acceptable to the Minister.

Reviewer's Name: _____ Phone # _____ Email: _____ Mail Routing Symbol: _____

Signature: _____ Date: _____ NAPA Number _____

BELL 205A-1 / 212 / 412

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the **INSTALLATION of the AERO DESIGN** **QUICK RELEASE CARGO BASKET**

Supplemental Type Certificate No. SH07-XX

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 205A-1 / 212 / 412 when fitted with the Quick Release Cargo Basket Installation. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.

Table of Contents

I	Limitations	3
II	Normal Procedures	3
III	Emergency Procedures	3
IV	Performance	3
V	Weight and Balance	4
VI	Installation / removal instructions	6

Record of Revisions

Revision	Issue Date	Pages Revised	Date Inserted	By
0	07 Sept, 2007	None		

I LIMITATIONS

1. The maximum load in the AERO Design Ltd. Quick Release Cargo Basket is 300 lb. (135.7 kg).
2. Flight operations limited to VFR conditions with AERO Design Ltd. Quick Release Cargo Basket installed.
3. V_{NE} is unchanged from the basic rotorcraft.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all cargo stored in the cargo basket is properly tied down and secured for flight.
 - b) Ensure that the lid of cargo basket is closed and secured.
 - c) Ensure the basket is locked in position on the beams. Pull up on the forward and aft end of the basket to check.

CAUTION

It is possible to exceed the lateral centre of gravity limits of the rotorcraft under some loading conditions. Pilots must ensure that lateral C of G is within limits when loading the basket.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

IV PERFORMANCE

No change from basic Approved Flight Manual.

V WEIGHT AND BALANCE

1. The following weight and balance is for the low mounted quick release cargo basket configuration, installed in accordance with drawing 75101.

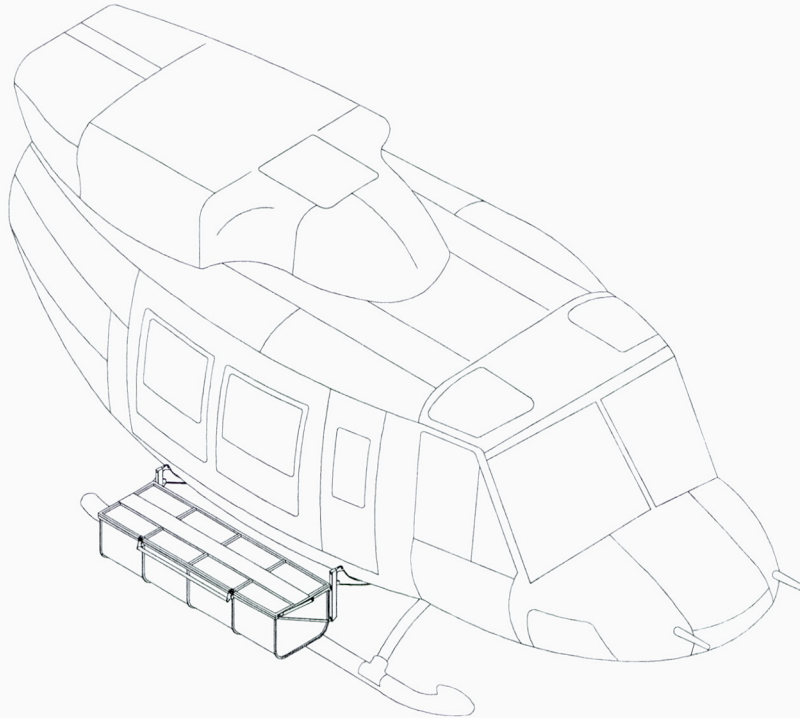


Figure 1 – Quick Release Cargo Basket Configuration

Quick Release Cargo Basket Configuration

Item	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
Cargo Basket Only ¹	49.5 lb	119.5 in	5 915 in*lb	62.2 in	3 079 in*lb
	22.4 kg	3035 mm	67 979 mm*kg	1580 mm	35 389 mm*kg
Cargo ² (MAX)	300 lb	119.5 in	35 850 in*lb	62.2 in	18 660 in*lb
	135.7 kg	3035 mm	411 991 mm*kg	1580 mm	214 480 mm*kg

¹ Weight and balance is for Cargo Basket only. Mounting beams are not included since they should have been included in the basic rotorcraft weight and balance at time of initial installation.

² Longitudinal and Lateral moment arms are given only for the center of the Cargo Basket. Due to the length of the basket, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations.

VI INSTALLATION / REMOVAL INSTRUCTIONS

The basket and beams are installed in accordance with drawing 75101. Removal of the basket leaving the beams in place is an approved configuration for flight. Logbook entry indicating installation or removal of basket and which weight and balance amendment is in effect is required when basket is installed or removed.

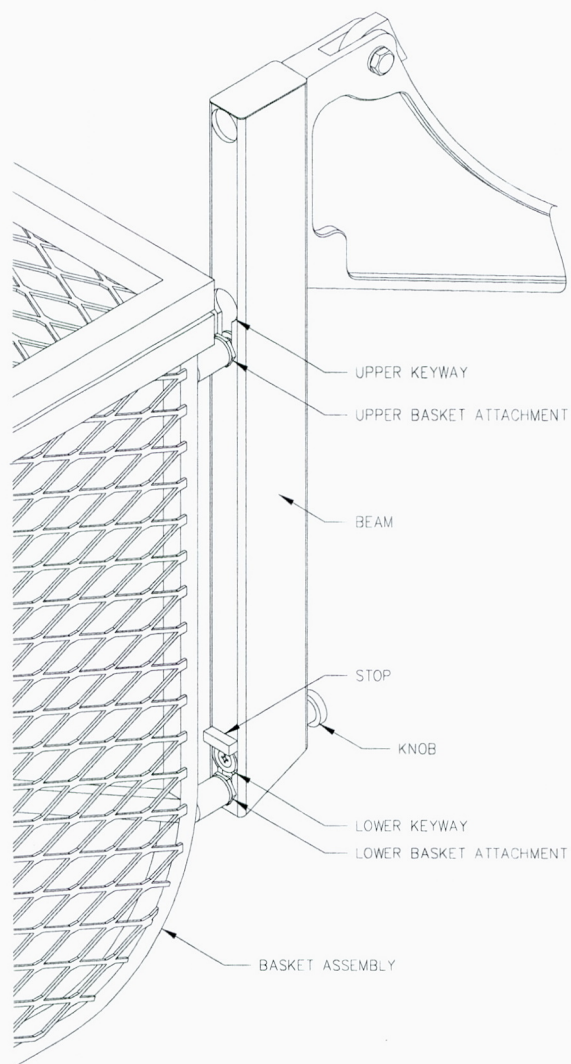


Figure 2 – Basket Attachment

1. Installation - Refer to Figure 2.
 1. Set basket upper attachment into keyway on forward and aft beams.
 2. At forward end of basket, lift until lower attachment fitting hits stop over keyway. Push fitting into keyway and slide basket down until locked. Repeat for aft end.
2. Removal - Refer to Figure 2.
 1. Pull knob at bottom end of forward beam and lift basket until lower attachment fitting is free of keyway. Keep upper basket attachment in keyway in beam. Repeat for aft end.
 2. Lift basket until upper attachments are out of keyways in beams and remove basket from helicopter.

AERO Design Ltd.

FLIGHT TEST PLAN

FTP751.03

BELL 205A-1

QUICK RELEASE CARGO BASKET

Prepared by: J. Clarke, CET

Approved by: E. Burgoin, P.Eng., DAR 290M

Revision 0, 06 September, 2007

AERO Design Ltd.
Engineering Consultants

2013 – 39th Avenue N.E., Calgary, Alberta T2E 6R7
Phone: (403) 250-8027
Fax: (403) 250-8333
E-Mail: info@aerodesignca

Notice: This report contains information and data which is proprietary to AERO DESIGN LTD. This report, or any portion thereof, may not be reproduced, copied, duplicated or used without the written consent of AERO DESIGN LTD.

TABLE OF CONTENTS

1.0	INTRODUCTION	3
2.0	REFERENCE TEXT	3
3.0	FLIGHT TEST OBJECTIVE	3
4.0	TEST PREPARATION	4
4.1	Instrument Calibration	4
4.2	Equipment	4
4.3	Flight Test Crew	4
4.4	Documents	4
4.5	Weight and Balance	4
5.0	FLIGHT TESTS	5

1.0 INTRODUCTION

The Quick Release Cargo Basket is mounted on the right side of the helicopter. The basket is made from steel tubing and expanded steel mesh. It is quickly detachable from the mounting beams that supports it. The beams fasten to the existing helicopter hard points provided by Bell.

2.0 REFERENCE TEXT

AERO Design Ltd. Installation Drawing 75101,
AERO Design Ltd. Flight Manual Supplement FMS751.91,
Bell 205A-1 Rotorcraft Flight Manual.

3.0 FLIGHT TEST OBJECTIVE

Flight testing of the Quick Release Cargo Basket is meant to demonstrate that the installation does not produce undesirable effects to the handling and performance qualities of the helicopter.

4.0 TEST PREPARATION

4.1 Instrument Calibration

The maintenance records of the test helicopter will be checked to ensure the airspeed indicator has been calibrated within the specified time period.

4.2 Equipment

The helicopter will be fitted with the Quick Release Cargo Basket installation in accordance with drawing 75101.

4.3 Flight Test Crew

Two or three crew members will be required for the test:

- 1) Pilot with training and experience appropriate to the task of testing this equipment.
- 2) Test observer, either a DAR or a qualified alternate appointed by him, beside the pilot.
- 3) (Optional) Test observer, appointed by the DAR, seated in the aft cabin to observe the basket.

All members of the crew will be equipped to communicate via intercom.

Seating arrangement of the observer(s) may be limited by loading requirements.

4.4 Documents

These test flights require a FLIGHT PERMIT issued by Transport Canada.

The draft Flight Manual Supplement shall be on board the aircraft.

The Pilot will familiarize himself with the contents of this Test Plan and the Flight Manual Supplement prior to flight.

4.5 Weight and Balance

The helicopter will be loaded with sufficient fuel and ballast to produce the following conditions for flight:

- A) 7500 lb GW, CG within limits specified in basic flight manual,
- B) 7500 lb GW, same CG as in flight above, with Cargo Basket Installed

Loading information specific to the Quick Release Cargo Basket is contained in the Flight Manual Supplement, FMS751.91. The Cargo Basket will be loaded to the placarded maximum (300 lbs).

For each case, all ballast in the cabin will be properly secured with cargo nets and/or tie-down straps.

5.0 FLIGHT TESTS

One flight is required for each of the conditions listed in 4.5 above.

- 1 - Baseline flight, 7500 lbs GW, CG within basic Flight Manual limitations.
- 2 - Flight with cargo basket, 7500 GW, same CG location as baseline flight.

The flights are to determine the following characteristics:

a) Low Speed Controllability

The purpose of the test is to verify low speed controllability.

Hover in ground effect. Translate forward, aft, and to each side. Adjust pedals to maintain rotorcraft heading and measure cyclic stick position for each motion. If a ground wind exists, attempt to maintain position in the hover in various orientations relative to the wind. The minimum speed for which controllability must be demonstrated is 17 knots.

b) Climb Performance

The purpose of this test is to provide climb performance information to supplement what is available in the original Rotorcraft Flight Manual.

Climb at V_Y of 54 KIAS. The power level used is Maximum Continuous Power (MCP) for the climbs, and this can be based on whichever limit (Q, N1, MGT) is reached first. Determine rate of climb by timing ascent from altitude to another. Longitudinal stability and direction stability must be positive at MCP climb.

For longitudinal static stability it is necessary to change the airspeed while keeping the collective position fixed at the position necessary to have MCP power at V_Y and measure longitudinal cyclic position, then increase speed to $1.2 \cdot V_Y$ and measure control position, then slow to $0.85 \cdot V_Y$ and measure control position. The data should show that cyclic position is further forward to maintain a speed faster than the trim speed, and further aft for speeds less than trim.

For directional stability the aircraft is set in a V_Y climb, with the collective held fixed at MCP for the zero side-slip condition. The lateral cyclic, and pedal positions and aircraft bank angle are recorded for each condition. The conditions required are: ball centred, 1/2 ball right, 1 ball right, 1/2 ball left and 1 ball left. The data should show that there is an increase in left pedal position to move the ball further right, that there is a requirement to move the cyclic further right as the ball is moved further right, and that more right bank is required as the ball moves further right - the converse is true for ball moving further left.

c) Maximum Level Flight Airspeed

The purpose of this test is to identify the maximum level flight airspeed (V_H) at MCP, and to compare the un-modified to the modified condition.

Accelerate the rotorcraft at MCP until level flight can no longer be maintained. Record airspeed (V_H) at MCP. Measure longitudinal cyclic stick position at V_H .

In the modified configuration, the longitudinal cyclic stick position shall not be farther forward in the un-modified condition.

d) Level Flight Controllability

The purpose of this test is to determine static longitudinal and static lateral stability in level flight.

For longitudinal static stability it is necessary to change the airspeed while keeping the collective position fixed. Trim the helicopter at $0.9 V_H$ (power kept set as that required to maintain level flight at $0.9 V_H$ and collective kept fixed for all test points). Reduce speed to $0.7 V_H$ and measure cyclic position, then increase to $1.1 V_H$ and measure cyclic position. The data should show that cyclic position is further forward to maintain a speed faster than the trim speed, and further aft for speeds less than trim.

For directional stability trim the helicopter at $0.9 V_H$ with power set at that required to maintain level flight at $0.9 V_H$ (collective is kept fixed for all test points). The conditions required are: ball centred, 1/2 ball right, 1 ball right, 1/2 ball left and 1 ball left. The data should show that there is an increase in left pedal position to move the ball further right, that there is a requirement to move the cyclic further right as the ball is moved further right, and that more right bank is required as the ball moves further right - the converse is true for ball moving further left.

e) V_{NE}

The purpose of this test is to determine the V_{NE} and controllability at V_{NE} of the modified configuration. V_{NE} of the un-modified helicopter is sought for the modification.

Refer to basic Rotorcraft Flight Manual for further limitations and information.

$V_{NE} = 120 \text{ KIAS @ } 7500 \text{ lbs GW}$

Decrease V_{NE} by 3 kts per 1000 ft above 3000 ft H_D

Accelerate at MCP to V_{NE} . Bank 30 degrees right and measure cyclic stick position. Bank 30 degrees left and measure cyclic stick position.

f) V_D

The purpose of this test is to ensure that there are no anomalous vibrations or erratic aircraft behaviour at speeds up to V_D .

$V_D = V_{NE} / 0.9$

$V_D = 120 \text{ KIAS} / 0.9 = 133.3 \text{ KIAS @ } 7500 \text{ lbs GW}$

Decrease V_{NE} by 3 kts per 1000 ft above 3000 ft H_D

Carefully accelerate at MCP until V_D ($V_{NE}/0.9$) is reached. Observe for vibrations or erratic aircraft behaviour. Reduce power and recover.

e) Autorotation Controllability

The purpose of this test is to show that the autorotation entry characteristics and steady state autorotation are controllable.

Set the helicopter in level flight at 55 - 60 KIAS and reduce the engine to idle, delay reducing collective for 1 second, and then react normally to enter autorotation. The helicopter is maneuvered in autorotation to ensure that adequate control margins exist. There is no requirement to measure control positions unless unusual behaviour is observed. Repeat with entry at 100 KIAS.

f) Approach and Landing

Approach and land normally. If a ground wind is present, land cross-wind.

The pilot shall report to the observer any satisfactory or not satisfactory handling and controllability characteristics for each phase of the flight.

BASKET INSTALLED: (Y / N) TAKE-OFF WEIGHT: _____ C.G.: _____		CYCLIC POSITION			RESULTS	
Test Phase	Test Procedure	DIRECTION	X	Y		OK
a) HOVER	Translate slowly FORWARD 20 KIAS	STRAIGHT				
a) HOVER	Translate slowly AFT 10 KIAS	STRAIGHT				
a) HOVER	Translate slowly RIGHT 20 KIAS	RIGHT				
a) HOVER	Translate slowly LEFT 20 KIAS	LEFT				
b) CLIMB	Rate of Climb	N/A	N/A	N/A	Engine Torque: _____ Start Time: _____ Altitude: _____ Stop Time: _____ Altitude: _____	
b) CLIMB	Longitudinal Static Stability	V_Y $1.2 V_Y$ $0.85 V_Y$				
b) CLIMB	Directional Static Stability	Ball Centre $\frac{1}{2}$ Right 1 Right $\frac{1}{2}$ Left 1 Left				
c) MAX LEVEL FLIGHT	Maximum Level Flight Speed (V_H)	N/A	N/A	N/A	Engine Torque: _____ Altitude: _____ Speed Attained: _____	
d) CRUISE	Longitudinal Static Stability	$0.9 V_H$ $0.7 V_H$ $1.1 V_H$				

BASKET INSTALLED: (Y / N) TAKE-OFF WEIGHT: _____ C.G.: _____		CYCLIC POSITION			RESULTS	
Test Phase	Test Procedure	DIRECTION	X	Y		OK
d) CRUISE	Directional Static Stability	Ball Centre ½ Right 1 Right ½ Left 1 Left				
e) V_{NE}	Descend & apply power as required $V_{NE} = 120$ KIAS	STRAIGHT RIGHT LEFT			Engine Torque: _____ Speed Attained: _____	
f) V_D	Descend & apply power as required $V_D = 133.3$ KIAS	N/A	N/A	N/A	Engine Torque: _____ Speed Attained: _____	
AUTOROTATE	Entry speed 55-60 KIAS				Entry Altitude: _____	
AUTOROTATE	Entry speed 100 KIAS				Entry Altitude: _____	
HANDLING	NOTE ANY COMMENTS OR OBSERVATIONS					

The test described above has been performed in accordance with the applicable standards of airworthiness.		
Signed:	Date:	Aircraft Make/Model:
Approval #:		Aircraft Serial No./Registration:

1 PM Start
1:55 PM Finish
C-FTGK

on ground.

12

17

Baseline
Condition

Measurement

X \longleftrightarrow

Y \updownarrow

left hover

16 $\frac{1}{4}$

21 $\frac{1}{2}$

hover right

14 $\frac{1}{2}$

21

hover aft

15

22 $\frac{1}{4}$

Climb @ MCP

1) 1 min

~~4550~~ ~~4550~~

6750

Alt 290

2) 1 min

~~4550~~ ~~4550~~

6750

Alt 110

V_H @ MCP

Alt 5400

112 kts

14

18

□

Autorotation @ 55 kts

Start

14 $\frac{1}{4}$

19

14

20

Autorotation @ 100 kts

Start

14 $\frac{1}{4}$

17

13 $\frac{1}{2}$

19

Cruise @ 105 kts

14 $\frac{1}{4}$

17 $\frac{1}{4}$

Start 2:35
 Finish 3:30
 Modified Flight

Measurement

Hover	X \longleftrightarrow	Y \updownarrow
left	15 $\frac{3}{4}$	20 21
right	15	20 $\frac{1}{2}$
left 9 kts \rightarrow force from stick on	15 $\frac{1}{4}$	21
cruise @ 90 kts	15	18
Climb @ MCP		
1 min	finish 6600	HOG 331
1 min	finish 6200	140 140
Autorotation @ 65	14 $\frac{1}{2}$	20
40 Climb @ V_y	15 $\frac{1}{4}$	18 $\frac{1}{4}$
46	15 $\frac{1}{4}$	19
65	15 $\frac{1}{4}$	18
Autorotation @ 100	13 $\frac{3}{4}$	19

Modified

Climb @ 54

0
 1/2 ball left
 1 ball left
 1/2 ball right
 1 ball right

X \longleftrightarrow

15 1/4
 15
 14 3/4
 15 \nearrow
 15 1/4 \nearrow

\uparrow ~~4~~ ~~1/4~~
 18 3/4 \checkmark
 19
 18 3/4
 18 1/4 \downarrow
 18 3/4 \downarrow

VH @ 5500 ft MCP ¹⁰⁸ ~~112~~ kts

15

17 ~~*~~

Cruise @ 100

15
 14 3/4
~~15~~ 15

17
 17
 17 7/8

5500 ft 105
 70

Cruise @ 100

0
 1/2 ball left
 1 ball

14 3/4
 14 3/4
 14 ~~3/4~~ 3/4

17 1/2
 18
 18 1/2

1/2 ball right
 1 ball

15
 15 1/8

~~17~~
 17

~~Bank 30° right~~ ~~100 kts~~ ~~100 kts~~

Bank 30° right



14 3/4
 14 1/2
 15

17 1/4
~~17 1/4~~ 18
 18

Bank 30° left

Cruise @ 100

14 3/4

17 1/2

AERO Design Ltd.

FLIGHT TEST PLAN

FTP751.03

BELL 205A-1

QUICK RELEASE CARGO BASKET

+0.015
to AS350
clamps

Prepared by: J. Clarke, CET

Approved by: E. Burgoin, P.Eng., DAR 290M

Revision 0, 06 September, 2007

AERO Design Ltd.
Engineering Consultants

2013 – 39th Avenue N.E., Calgary, Alberta T2E 6R7

Phone: (403) 250-8027

Fax: (403) 250-8333

E-Mail: info@aerodesignca

Notice: This report contains information and data which is proprietary to AERO DESIGN LTD. This report, or any portion thereof, may not be reproduced, copied, duplicated or used without the written consent of AERO DESIGN LTD.

TABLE OF CONTENTS

1.0	INTRODUCTION	3
2.0	REFERENCE TEXT	3
3.0	FLIGHT TEST OBJECTIVE	3
4.0	TEST PREPARATION	4
4.1	Instrument Calibration	4
4.2	Equipment	4
4.3	Flight Test Crew	4
4.4	Documents	4
4.5	Weight and Balance	4
5.0	FLIGHT TESTS	5

1.0 INTRODUCTION

The Quick Release Cargo Basket is mounted on the right side of the helicopter. The basket is made from steel tubing and expanded steel mesh. It is quickly detachable from the mounting beams that supports it. The beams fasten to the existing helicopter hard points provided by Bell.

2.0 REFERENCE TEXT

AERO Design Ltd. Installation Drawing 75101,
AERO Design Ltd. Flight Manual Supplement FMS751.91,
Bell 205A-1 Rotorcraft Flight Manual.

3.0 FLIGHT TEST OBJECTIVE

Flight testing of the Quick Release Cargo Basket is meant to demonstrate that the installation does not produce undesirable effects to the handling and performance qualities of the helicopter.

4.0 TEST PREPARATION

4.1 Instrument Calibration

The maintenance records of the test helicopter will be checked to ensure the airspeed indicator has been calibrated within the specified time period.

4.2 Equipment

The helicopter will be fitted with the Quick Release Cargo Basket installation in accordance with drawing 75101.

4.3 Flight Test Crew

Two or three crew members will be required for the test:

- 1) Pilot with training and experience appropriate to the task of testing this equipment.
- 2) Test observer, either a DAR or a qualified alternate appointed by him, beside the pilot.
- 3) (Optional) Test observer, appointed by the DAR, seated in the aft cabin to observe the basket.

All members of the crew will be equipped to communicate via intercom.

Seating arrangement of the observer(s) may be limited by loading requirements.

4.4 Documents

These test flights require a FLIGHT PERMIT issued by Transport Canada.

The draft Flight Manual Supplement shall be on board the aircraft.

The Pilot will familiarize himself with the contents of this Test Plan and the Flight Manual Supplement prior to flight.

4.5 Weight and Balance

The helicopter will be loaded with sufficient fuel and ballast to produce the following conditions for flight:

- A) 7500 lb GW, CG within limits specified in basic flight manual,
- B) 7500 lb GW, same CG as in flight above, with Cargo Basket Installed

Loading information specific to the Quick Release Cargo Basket is contained in the Flight Manual Supplement, FMS751.91. The Cargo Basket will be loaded to the placarded maximum (300 lbs).

For each case, all ballast in the cabin will be properly secured with cargo nets and/or tie-down straps.

5.0 FLIGHT TESTS

One flight is required for each of the conditions listed in 4.5 above.

- 1 - Baseline flight, 7500 lbs GW, CG within basic Flight Manual limitations.
- 2 - Flight with cargo basket, 7500 GW, same CG location as baseline flight.

The flights are to determine the following characteristics:

a) Low Speed Controllability

The purpose of the test is to verify low speed controllability.

Hover in ground effect. Translate forward, aft, and to each side. Adjust pedals to maintain rotorcraft heading and measure cyclic stick position for each motion. If a ground wind exists, attempt to maintain position in the hover in various orientations relative to the wind. The minimum speed for which controllability must be demonstrated is 17 knots.

b) Climb Performance

The purpose of this test is to provide climb performance information to supplement what is available in the original Rotorcraft Flight Manual.

Climb at V_Y of 54 KIAS. The power level used is Maximum Continuous Power (MCP) for the climbs, and this can be based on whichever limit (Q, N1, MGT) is reached first. Determine rate of climb by timing ascent from altitude to another. Longitudinal stability and direction stability must be positive at MCP climb.

For longitudinal static stability it is necessary to change the airspeed while keeping the collective position fixed at the position necessary to have MCP power at V_Y and measure longitudinal cyclic position, then increase speed to $1.2 \cdot V_Y$ and measure control position, then slow to $0.85 \cdot V_Y$ and measure control position. The data should show that cyclic position is further forward to maintain a speed faster than the trim speed, and further aft for speeds less than trim.

For directional stability the aircraft is set in a V_Y climb, with the collective held fixed at MCP for the zero side-slip condition. The lateral cyclic, and pedal positions and aircraft bank angle are recorded for each condition. The conditions required are: ball centred, 1/2 ball right, 1 ball right, 1/2 ball left and 1 ball left. The data should show that there is an increase in left pedal position to move the ball further right, that there is a requirement to move the cyclic further right as the ball is moved further right, and that more right bank is required as the ball moves further right - the converse is true for ball moving further left.

c) Maximum Level Flight Airspeed

The purpose of this test is to identify the maximum level flight airspeed (V_H) at MCP, and to compare the un-modified to the modified condition.

Accelerate the rotorcraft at MCP until level flight can no longer be maintained. Record airspeed (V_H) at MCP. Measure longitudinal cyclic stick position at V_H .

In the modified configuration, the longitudinal cyclic stick position shall not be farther forward in the un-modified condition.

d) Level Flight Controllability

The purpose of this test is to determine static longitudinal and static lateral stability in level flight.

For longitudinal static stability it is necessary to change the airspeed while keeping the collective position fixed. Trim the helicopter at $0.9 V_H$ (power kept set as that required to maintain level flight at $0.9 V_H$ and collective kept fixed for all test points). Reduce speed to $0.7 V_H$ and measure cyclic position, then increase to $1.1 V_H$ and measure cyclic position. The data should show that cyclic position is further forward to maintain a speed faster than the trim speed, and further aft for speeds less than trim.

For directional stability trim the helicopter at $0.9 V_H$ with power set at that required to maintain level flight at $0.9 V_H$ (collective is kept fixed for all test points). The conditions required are: ball centred, 1/2 ball right, 1 ball right, 1/2 ball left and 1 ball left. The data should show that there is an increase in left pedal position to move the ball further right, that there is a requirement to move the cyclic further right as the ball is moved further right, and that more right bank is required as the ball moves further right - the converse is true for ball moving further left.

e) V_{NE}

The purpose of this test is to determine the V_{NE} and controllability at V_{NE} of the modified configuration. V_{NE} of the un-modified helicopter is sought for the modification.

Refer to basic Rotorcraft Flight Manual for further limitations and information.

$V_{NE} = 120 \text{ KIAS @ } 7500 \text{ lbs GW}$

Decrease V_{NE} by 3 kts per 1000 ft above 3000 ft H_D

Accelerate at MCP to V_{NE} . Bank 30 degrees right and measure cyclic stick position. Bank 30 degrees left and measure cyclic stick position.

f) V_D

The purpose of this test is to ensure that there are no anomalous vibrations or erratic aircraft behaviour at speeds up to V_D .

$$V_D = V_{NE} / 0.9$$

$$V_D = 120 \text{ KIAS} / 0.9 = 133.3 \text{ KIAS @ } 7500 \text{ lbs GW}$$

Decrease V_{NE} by 3 kts per 1000 ft above 3000 ft H_D

Carefully accelerate at MCP until V_D ($V_{NE}/0.9$) is reached. Observe for vibrations or erratic aircraft behaviour. Reduce power and recover.

e) Autorotation Controllability

The purpose of this test is to show that the autorotation entry characteristics and steady state autorotation are controllable.

Set the helicopter in level flight at 55 - 60 KIAS and reduce the engine to idle, delay reducing collective for 1 second, and then react normally to enter autorotation. The helicopter is maneuvered in autorotation to ensure that adequate control margins exist. There is no requirement to measure control positions unless unusual behaviour is observed. Repeat with entry at 100 KIAS.

f) Approach and Landing

Approach and land normally. If a ground wind is present, land cross-wind.

The pilot shall report to the observer any satisfactory or not satisfactory handling and controllability characteristics for each phase of the flight.

BASKET INSTALLED: (Y / N) TAKE-OFF WEIGHT: _____ C.G.: _____		CYCLIC POSITION			RESULTS	
Test Phase	Test Procedure	DIRECTION	X	Y		OK
a) HOVER	Translate slowly FORWARD 20 KIAS	STRAIGHT				
a) HOVER	Translate slowly AFT 10 KIAS	STRAIGHT				
a) HOVER	Translate slowly RIGHT 20 KIAS	RIGHT				
a) HOVER	Translate slowly LEFT 20 KIAS	LEFT				
b) CLIMB	Rate of Climb <i>475 315° 4900 135 4900 6550 6700</i>	N/A	N/A	N/A	Engine Torque: <i>47</i> Start Time: _____ Altitude: <i>4900</i> Stop Time: _____ Altitude: <i>6700</i>	<i>110° 4900 6750</i>
b) CLIMB	Longitudinal Static Stability <i>↑</i>	V _Y 1.2 V _Y 0.85 V _Y				
b) CLIMB	Directional Static Stability <i>↑</i>	Ball Centre ½ Right 1 Right ½ Left 1 Left				
c) MAX LEVEL FLIGHT	Maximum Level Flight Speed (V _H)	N/A	N/A	N/A	Engine Torque: <i>47</i> Altitude: <i>5400</i> Speed Attained: <i>112</i>	<i>on GROUND BETWEEN FLIGHTS 7-9/24/00 +6°C ??</i>
d) CRUISE	Longitudinal Static Stability	0.9 V _H 0.7 V _H 1.1 V _H				

	BASKET ON	BASKET OFF PROVISIONS INSTALLED.
EMPTY WEIGHT	6043	6043
BASKET	<u>59</u>	<u>9</u>
	6102	6052
PEOPLE		
JOHN 185		
TED 215		
JEFF 180		
	<u>680</u>	<u>680</u>
BALLAST	300	350
FUEL	<u>900</u>	<u>900</u>
	7982	7982

BASKET INSTALLED: (Y / N) TAKE-OFF WEIGHT: _____ C.G.: _____		CYCLIC POSITION			RESULTS	
Test Phase	Test Procedure	DIRECTION	X	Y		OK
d) CRUISE	Directional Static Stability	Ball Centre ½ Right 1 Right ½ Left 1 Left				
e) V _{NE}	Descend & apply power as required V _{NE} = 120 KIAS	STRAIGHT RIGHT LEFT			Engine Torque: _____ Speed Attained: _____	
f) V _D	Descend & apply power as required V _D = 133.3 KIAS	N/A	N/A	N/A	Engine Torque: _____ Speed Attained: _____	
AUTOROTATE	Entry speed 55-60 KIAS				Entry Altitude: <u>6200</u> <i>Poselen</i>	
AUTOROTATE	Entry speed 100 KIAS				Entry Altitude: <u>6500</u>	
HANDLING	NOTE ANY COMMENTS OR OBSERVATIONS					

The test described above has been performed in accordance with the applicable standards of airworthiness.		
Signed: <i>[Signature]</i>	Date: _____	Aircraft Make/Model: _____
Approval #: _____		Aircraft Serial No./Registration: _____

1500

1500

1500

1500

1500

1500

1500

1500

1500

5830

6043.26

59

6102

680 Purple

6782

1200

7982

213

80950

7770

1500

Transport
CanadaTransports
Canada

FLIGHT AUTHORIZATION

AUTORISATION DE VOL

To: - GUARDIAN HELICOPTERS
A: SPRINGBANK ALBERTA

Nationality and Registration Marks Marques de nationalité et d'immatriculation	Aircraft Manufacturer and Model Constructeur et modèle de l'aéronef	Aircraft Serial Number Numéro de série de l'aéronef	Category - Catégorie
C-FTGK	BELL 205	30009	

THIS CONSTITUTES:
LA PRÉSENTE CONSTITUE:

☐ A CERTIFICATE OF AIRWORTHINESS
UN CERTIFICAT DE NAVIGABILITÉ

☐ STANDARD

In respect of Part II of Annex 16 (aircraft noise) to the Convention of International Aviation and Aeronautics Act, this aircraft:

En vertu de la Partie II de l'Annexe 16 (bruit des aéronefs) de la Convention relative à l'Aviation civile internationale et de la Loi sur l'aéronautique, l'aéronef mentionné

☐ complies with the requirements
satisfait aux exigences

☐ does not comply with the requirements
ne satisfait pas aux exigences

☐ is not required to comply
n'est pas obligé de satisfaire aux exigences

☐ SPECIAL - SPÉCIAL

☐ Provisional - Provisoire

☐ Restricted - Restreint

☐ Amateur-Built - Construction amateur

☐ Limited - Limité

This document is subject to special compulsory conditions of issue (operating limitations) specified on the reverse side of this document.

Le présent document est assujéti aux conditions de délivrance obligatoires et spéciales (limites d'utilisation) stipulées au verso.

Indicate Numbers - Inscrire les numéros

THIS CONSTITUTES:
LA PRÉSENTE CONSTITUE:

☒ A FLIGHT PERMIT
UN PERMIS DE VOL

☐ EXPERIMENTAL - EXPÉRIMENTAL

☐ SPECIFIC PURPOSE - FIN SPÉCIFIQUE

☐ Ferry Flight
Vol de convoyage

☐ Demonstration, market survey or crew training
Vol de démonstration, étude de marché ou formation d'équipage

☒ Test purposes following repair, modification or maintenance
Vol d'essai à la suite de réparation, modification ou maintenance

☐ Importation or exportation flight
Vol pour fin d'importation ou d'exportation

☐ Other (Specify)
Autre (Préciser)

Flight from - Vol de

To - À

To - À

WITHIN VICINITY OF SPRINGBANK - AUTHORIZED TO (UNE/0.?)

This document is subject to special compulsory conditions of issue (operating limitations) specified on the reverse side of this document.

Le présent document est assujéti aux conditions de délivrance obligatoires et spéciales (limites d'utilisation) stipulées au verso.

Indicate Numbers - Inscrire les numéros

8, 13, 16

FLIGHT TESTS PER AERC DESIGN FLIGHT TEST PLAN FTP 751.03 Rev D

This document is valid for the number of days indicated on the right, following the date of issue. Where pertinent, a replacement flight permit or a certificate of airworthiness will be issued to you.

Le présent document reste valide pendant le nombre de jours indiqués à droite qui suivent la date de délivrance. S'il y a lieu, un permis de vol ou un certificat de navigabilité de remplacement vous sera délivré.

Days - Jours

90

For the Minister of Transport - Pour le ministre des Transports

Date of Issue
Date de délivrance

Regional Office - Bureau régional

Nov 29, 2007 P.N.R. Calgary

Fee paid - Montant versé

\$

☐ Cash
Comptant

☐ Cheque
Chèque

Canada

Jeff Clarke

From: Jeff Clarke [jeff@aerodesign.ca]
Sent: Wednesday, December 05, 2007 11:22 AM
To: 'Brulotte, Michel'; 'Staal, Jack'
Subject: RE: Bell Medium Cargo Basket Flight Test Plan
Attachments: FTP751.03_0_205_results.pdf

Michel / Jack,

The company flight tests were performed yesterday. Attached is the completed flight test plan. Please let me know if you have any questions.

Regards,

Jeff Clarke

AERO Design Ltd.

12/5/2007

Jeff Clarke

From: Jeff Clarke [jeff@aerodesign.ca]
Sent: Tuesday, December 04, 2007 8:37 AM
To: 'Staal, Jack'
Subject: Bell 205A-1 Cargo Basket
Attachments: SI513-008_AppA_signed.pdf; TR751.02_0.pdf; ER751.01_0.pdf; FMS751.91_0.pdf; ICA751.90_0.pdf; Msi_53_signed.pdf

Jack,

Attached are the Engineering and Test Reports, ICA and MSI 53 Review, proposed FMS, and signed SI513-008 Appendix A for the Bell 205 Cargo Basket. Please let me know if you have any questions.

Regards,

Jeff

12/5/2007

Jeff Clarke

From: Jeff Clarke [jeff@aerodesign.ca]
Sent: Tuesday, November 27, 2007 12:04 PM
To: 'Staal, Jack'
Subject: Bell 205/212 Basket
Attachments: DCL751-3_0.pdf; DCL751-1_0.pdf; DCL751-2_0.pdf

Jack,

Please find attached the DCLs for the cargo basket installation. They are split up to allow for possible future installation of different equipment.

Let me know if you need anything else.

Regards,

Jeff Clarke

AERO Design Ltd.

12/5/2007

Jeff Clarke

From: Jeff Clarke [jeff@aerodesign.ca]
Sent: Tuesday, November 27, 2007 2:12 PM
To: 'Staal, Jack'
Subject: RE: Cargo Basket Revisions C-07-1032 is NAPA file.
Attachments: 75132_0.pdf; 75101_0.pdf; 75110_0.pdf; 75111_0.pdf; 75112_0.pdf; 75115_0.pdf; 75116_0.pdf; 75130_0.pdf; 75131_0.pdf

Jack,

I will double check with Ted, but Guardian only has 205A-1's in the registry. I wrote the plan for 212 because I didn't know what we would have when the time came and I knew the Vne was higher.

Please find attached drawings for the major assemblies and parts of the cargo basket installation. Let me know if you need anything else.

Jeff

From: Staal, Jack [mailto:STAALJ@tc.gc.ca]
Sent: Tuesday, November 27, 2007 1:54 PM
To: jeff@aerodesign.ca
Subject: RE: Cargo Basket Revisions C-07-1032 is NAPA file.

Jeff,

I had a verbal from Ted just before noon that it was a 212.

The FTP refers to a 212?

Please double check. Cheers.

Thanks,
 Jack

-----Original Message-----

From: Jeff Clarke [mailto:jeff@aerodesign.ca]
Sent: Tuesday, November 27, 2007 1:30 PM
To: Staal, Jack
Subject: RE: Cargo Basket Revisions C-07-1032 is NAPA file.

Jack,

Flight test will be on a Bell 205A-1. Limitations on the permit will reflect Bell 205A-1 flight manual limits.

Max Vne for 205A-1 is 120 kts at 7500 lbs GW, decreasing to 110 kts over 8500 lbs GW.
 Max Vne for 212 is 130 kts at 7500 lbs GW, decreasing to 100 kts at 11200 lbs GW.

It is hoped that there will be no reduction in Vne for installation on any model based on this test, but further testing on other models can be done at a later date if need be.

Jeff

From: Staal, Jack [mailto:STAALJ@tc.gc.ca]

12/5/2007

Sent: Tuesday, November 27, 2007 1:02 PM
To: Jeff Clarke (E-mail); McNab, David; Stewart, Malcolm
Subject: FW: Cargo Basket Revisions C-07-1032 is NAPA file.

Hi Jeff,

Can you ensure Guardian applies for a flight test permit and completes the flight test plan. Ensure they go to the Bell 212 Vne/.9 if they want an unrestricted speed envelope. We will have to assess the resulting data for the other models as needed (differing Vne's ? possible FMS limitation needed for other models ???).

David/Malcolm: Aero Design Ltd FT plan FTP751.03 is attached for flight permit reference.

Jeff: Send us a copy of the completed test plan as soon as possible.

Regards,

J.H. (Jack) Staal
Aircraft Certification Technologist | Technologue, Certification des aeronefs
Prairie and Northern Region | Region des Prairies et du Nord

Telephone | telephone: (780)495-5227
Facsimilie | telecopier: (780)495-7963
Email | courriel: staalj@tc.gc.ca
TTY / ATS : 1-888-675-6863

Transport Canada | Transports Canada
1100- 9700, Jasper Avenue | avenue Jasper (RAED)
Edmonton, AB T5J 4E6
Government of Canada | Gouvernement du Canada

-----Original Message-----

From: Staal, Jack
Sent: Tuesday, November 27, 2007 12:29 PM
To: Brulotte, Michel
Subject: RE: Cargo Basket Revisions

Flight test aircraft will be the 212. Guardian Helicopters is the operator. I don't have the registration off hand but if you need it let me know. Application is for 205/212/412.

Regards,

J.H. (Jack) Staal
Aircraft Certification Technologist | Technologue, Certification des aeronefs
Prairie and Northern Region | Region des Prairies et du Nord

Telephone | telephone: (780)495-5227
Facsimilie | telecopier: (780)495-7963
Email | courriel: staalj@tc.gc.ca
TTY / ATS : 1-888-675-6863

Transport Canada | Transports Canada

1100- 9700, Jasper Avenue | avenue Jasper (RAED)
Edmonton, AB T5J 4E6
Government of Canada | Gouvernement du Canada

-----Original Message-----

From: Brulotte, Michel
Sent: Tuesday, November 27, 2007 12:22 PM
To: Staal, Jack
Subject: RE: Cargo Basket Revisions

What aircraft type is it Jack? I will have to leave Calgary on the 12-th in the evening at the latest to be able to get to Moncton for another flight test on 13 Dec.

Michel

-----Original Message-----

From: Staal, Jack
Sent: Tuesday, November 27, 2007 2:02 PM
To: Brulotte, Michel
Subject: FW: Cargo Basket Revisions
Importance: High

Hi Michel,

December 11 /12 is confirmed. Ted might not be available for Dec 10th so he would rather not formally schedule that date.
Attached is the Flight Test plan.

Helicopter is at Springbank just west of Calgary.

Thanks,

J.H. (Jack) Staal

Aircraft Certification Technologist | Technologue Certification des aeronefs
Prairie and Northern Region | Region des Prairies et du Nord

Telephone | telephone: (780)495-5227
Facsimilie | telecopier: (780)495-7963
Email | courriel: staalj@tc.gc.ca
TTY / ATS : 1-888-675-6863

Transport Canada | Transports Canada
1100- 9700, Jasper Avenue | avenue Jasper (RAED)
Edmonton, AB T5J 4E6
Government of Canada | Gouvernement du Canada

-----Original Message-----

From: Jeff Clarke [<mailto:jeff@aerodesign.ca>]
Sent: Friday, November 02, 2007 2:45 PM
To: Staal, Jack
Subject: Cargo Basket Revisions

Jack,

I have a package ready for a somewhat substantial revision to our cargo basket approval. The major change is the addition of a quick release high mounted basket, which Greg witnessed the test on a month or so back.

Attached is the cover letter, which has a description of the changes. I can courier the package up, and/or can arrange to come up to Edmonton to go over the changes with you if need be.

Guardian Helicopters has expressed interest in our Bell 205/212 basket and are willing to do flight testing for us. Attached is the proposed flight test plan. If we start with an LSTC on this basket, will a flight test witnessed by Ted be acceptable? If not we may go right for the STC. I will get an application/compliance program/project summary in to you on Monday either way to get the project going. We did a load test on the basket installation, and can re-do that test (with a test plan) if it needs to be witnessed by yourself or Greg.

Please let me know if you have any questions.

Regards,

Jeff Clarke

AERO Design Ltd.

Jeff Clarke

From: Brulotte, Michel [BRULOTM@tc.gc.ca]
Sent: Monday, December 03, 2007 10:00 AM
To: jeff@aerodesign.ca; Staal, Jack
Cc: Jupp, Bill
Subject: RE: Bell Medium Cargo Basket Flight Test Plan

Jeff,

I am unclear as to whether I will be performing a flight test as part of the initial certification. If I am then it is not critical that you test the speed band I had discussed in my comments since I will test the full envelope. The speeds in the RFM are recommended minimum rate of descent airspeeds and are not limiting. The tests we perform are conducted from a speed slower than the recommended speed, ie 40 KIAS up to aircraft Vne for the conditions being flown under. So that means that we would fly to faster than 100 KIAS.

I did not intend that my comments would be included verbatim into the test plan. The intent of the comments was to explain the rationale for the tests, the techniques, and test sequence. I don't believe that it is appropriate for applicants that do not have extensive flight test knowledge to perform the kinds of detailed tests that are needed to show compliance with CAR 527/529. I would suggest that Aero Design conduct a test that is consistent with the simplified Flight Test that has traditionally been used for these types of projects. TC will then conduct certification flight tests after the simplified test has been completed.

Please keep me informed as to the dates of the test, and let me know as soon as you know that the test dates are firm.

Michel Brulotte
ETP
(613) 952-4317

12/3/2007

05 November, 2007

Transport Canada
Aircraft Certification Division
11th Floor, Canada Place
9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Attn: Jack Staal

Your File : C-07-1032

Our File : 751

Re: Bell 205A-1/212 Cargo Basket

Jack,

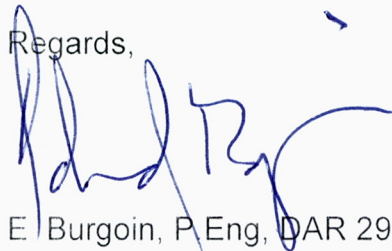
Please find attached the following documents related to this project:

Modification Approval Request Application Form
Compliance Program
Project Summary

MOD751
CP751
PS751

Revision 0
Revision 0
Revision 0

Regards,



E. Burgoin, P. Eng, DAR 290M

Encl.

Title: Quick Release Cargo Basket

Approval: STC

Manufacture: Mfd by Aero Design (amend Approved Product List)

Customer:

Type and Model: Bell Medium

Definition Of Change:

Description:

The quick release cargo basket developed for the Bell 206L and 407 is the right size for operators on forestry contracts using Bell 205A-1/212 helicopters. The contract requires a bambi-bucket, chain saw, and a few jerry cans of gasoline. All of these items fit within the 206L basket and are within the existing 200 lbs weight limitation.

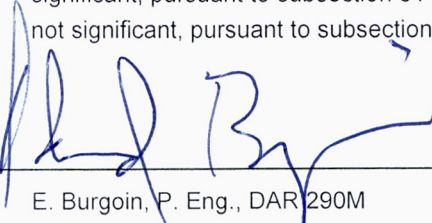
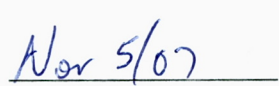
A quick release basket for the Bell 205A-1 and 212 must be shortened about 3" to fit within the existing hard points under the main cabin door of the helicopter. With the exception of the change in length, the remainder of the construction of the basket is unchanged. The allowable load in the basket is increased to 300 lbs to remain competitive with existing products.

Primary Changes to the Aeronautical Product:

Installation of forward and aft mounting beams, installation of basket

Secondary Changes to the Aeronautical Product (Required as consequence of primary changes):

Other Relevant Modifications to the Aeronautical Product (Which impact on this change):

CHANGED PRODUCT RULE (CPR) DECISION RECORD	
NAPA No.:	
Step 1: Identify the proposed change to the aeronautical product. (Section 4.1 of AC 500-016)	The changes are as previously described.
Step 2: Is the change substantial? (Section 4.2 of AC 500-016)	<input type="checkbox"/> Yes A new type certificate is required. CPR Decision Process is Closed . <input checked="" type="checkbox"/> No Proceed to Step 3
Step 3: Will the latest standards be used? (Section 4.3 of AC 500-016)	<input type="checkbox"/> Yes Certification basis to use latest standards. CPR Decision Process is Closed . <input checked="" type="checkbox"/> No Proceed to Step 4.
Step 4: Is the proposed change significant? (Section 4.4 of AC 500-016)	<input type="checkbox"/> Yes Proceed to Decision. <input checked="" type="checkbox"/> No Compliance may be shown to earlier standards. Certification basis to be defined and documented as indicated (below). CPR Decision Process is Closed .
Decision: Will the latest standards be used?	<input type="checkbox"/> Yes Certification basis to use latest standards. CPR Decision Process is Closed . <input checked="" type="checkbox"/> No Proceed to Step 5, addressing each area separately (see below).
Identification of Affected Areas:	The area(s) affected by the proposed change have been detailed in Compliance Program: CP751
Note: A delegate may develop a proposal for the Yes/No decision of Step 6, however, TCCA will make the final determination.	
Area:	
Step 5: Is this area affected by the proposed change? (Section 6.1 of AC 500-016)	<input type="checkbox"/> Yes Proceed to Step 6. <input type="checkbox"/> No Compliance with the latest standards is not required. Compliance may be shown to earlier standards. Certification basis defined or documented as indicated below.
Step 6: Are the latest standards practical and do they contribute materially to the level of safety? (Section 6.2 of AC 500-016)	<input type="checkbox"/> Yes Certification basis to be established using latest standards. <input type="checkbox"/> No Compliance with the latest standards is not required. Compliance may be shown to earlier standards. Certification Basis defined or documented as indicated in below.
<input type="checkbox"/> Continuation Sheet(s) Attached	
Certification Basis	The certification basis is as follows or as detailed in the listed document(s): Bell 205A-1: CAR 7 dated August 1, 1956, Amendments 7-1 through 7-4, Category B. Bell 212/412: FAR Part 29 dated 1 February 1965, Amendments 29-1 and 29-2, and FAR 29.473, 29.501, 29.771, 29.903(c), 29.1323, and 29.1505(b) of Amend. 29-3, FAR 29.663 of Amendment 29-3 (412 only)
Under the delegated authority, I have examined the change in type design listed above according to established procedures and hereby determine, to the best of my knowledge and belief, that it is. (check one)	
<input type="checkbox"/> substantial, pursuant to subsection 511.14 or 513.14 of the CARs <input type="checkbox"/> significant, pursuant to subsection 511.13(3) or 513.07(3) of the CARs <input checked="" type="checkbox"/> not significant, pursuant to subsection 511.13(3) or 513.07(3) of the CARs	
 E. Burgoin, P. Eng., DAR 290M	 Date

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.
2013 39th Avenue NE
Calgary, Alberta, T2E 6R7

DATE: 7 September, 2007
REV. No. 0

CORRESPONDANCE TO:
(If other than applicant)

MAKE: Bell
MODEL: 205A-1, 212, 412

REGISTRATION: All Applicable
SERIAL No.: All Applicable

NATURE OF WORK: Installation of Side-Mounted External Cargo Basket

MODEL CERTIFICATION BASIS: FAR 29, Amendment 29-2, plus sections of 29-3 (Bell 412 basis of certification)

MODIFICATION CERTIFICATION BASIS: FAR 29, Amendment 29-2, plus sections of 29-3

Airworthiness Requirement		Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.					
Subpart B – Flight						
29.27	2	Centre of Gravity Limits	N/A			No change from Type Approval.
29.29	2	Empty Weight and Corresponding C of G	Data specified on inst'n drawing		X	
29.45	2	Performance - General	Flight Test	X		Flight test in accordance with FTP751.03
29.51	2	Takeoff data: General	Flight Test	X		
29.63	2	Takeoff: Category B	Flight Test	X		
29.65	2	Category B Climb: All Engines Operating	Flight Test	X		
29.71	2	Helicopter Angle of Glide: Category B	Flight Test	X		
29.73(b)	2	Performance at Min. Operating Speed	Flight Test	x		
29.75	2	Landing	Flight Test	X		
29.141	2	Flight Characteristics – General	Flight Test	X		
29.143	2	Controllability and Maneuverability	Flight Test	X		
29.161	2	Trim Control	Flight Test	X		
29.171	2	Stability – General	Flight Test	X		
29.173	2	Static Longitudinal Stability	Flight Test	X		
29.175	2	Demonstration of Longitudinal Stability	Flight Test	X		
29.241	2	Ground Resonance	Flight Test	X		
29.251	2	Vibration	Flight Test	X		

Subpart C – Strength Requirements

29.301	2	Loads – Air Drag Loads	Analysis		X	
--------	---	------------------------	----------	--	---	--


AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

Airworthiness Requirement	Subject for Compliance or Documentary Proof		Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.					
29.301	2	Loads – Inertia Loads	Compliance with 29.337 and 29.561		X	
29.303	2	Factor of Safety	Analysis		X	
29.305	2	Strength and Deformation	Analysis and Test iaw AC 43.13-1B		X	
29.307	2	Proof of Structure	Analysis and Test iaw AC 43.13-1B		X	
29.337(a)	2	Limit Maneuvering Load Factor – Positive	Analysis and Test iaw AC 43.13-1B		X	Critical load factor in downward direction.
29.547	2	Main Rotor Structure	Flight Test	X		
29.561	2	Emergency Landing Conditions	Analysis and Test iaw AC 43.13-1B		X	
29.561(b)3(i)	2	Emergency Landing Conditions – Up	Analysis and Test iaw AC 43.13-1B		X	
29.561(b)3(ii)	2	Emergency Landing Conditions – Fwd	N/A			Forward deflection or failure of basket poses no threat to occupants.
29.561(b)3(iii)	2	Emergency Landing Conditions – Side	Analysis and Test iaw AC 43.13-1B		X	
29.561(b)3(iv)	2	Emergency Landing Conditions – Down	Compliance with 29.337		X	29.337 Maneuvering Load is Critical.
Subpart D – Design and Construction						
29.601	2	Design	Drawings		X	Design is conventional.
29.603	2	Materials	Drawings		X	Materials used are specified in Mil-Hdbk-5J.
29.605	2	Fabrication Methods	Drawings		X	Design is conventional.
29.609	2	Protection of Structure	Drawings		X	
29.611	2	Inspection Provisions	Drawings		X	Design is easy to inspect.
29.613	2	Material Strength Properties and Design Values	Values used as per Mil-Hdbk-5J		X	
29.625	2	Fitting Factor	Analysis		X	
29.783	2	Doors	N/A			Installation does not block doors.
29.787(a)	2	Cargo and Baggage Compartments	Compliance with 23.301 through 307		X	
29.787(b)	2	Cargo and Baggage Compartments	Design		X	Basket is a closed container.
29.787(c)	2	Cargo and Baggage Compartments	N/A			Cargo is external to helicopter.
29.807	2	Emergency Exits	N/A		X	Installation does not block doors.
29.1387	2	Position Light System Dihedral Angles	N/A – statement in report			No change from Type Approval.
29.1401	2	Anticollision Light System	N/A – statement in report			No change from Type Approval.

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.				
Subpart G – Operating Limitations and Information					
29.1505	3	Never Exceed Speed	Flight Test, Flight Manual Supplement	X	V _{NE} limits as specified in the existing Flight Manual
29.1525	2	Kinds of Operation	Flight Manual Supplement	X	Limited to VFR only.
29.1529	2	Maintenance Manual	ICA Provided	X	
29.1557(a)	2	Miscellaneous Markings and Placards – Baggage Compartments	Placard on lid		X
29.1557(b)	2	Miscellaneous Markings and Placards	N/A		
29.1557(c)	2	Miscellaneous Markings and Placards	N/A		
29.1557(d)	2	Miscellaneous Markings and Placards	N/A		
29.1581	2	Rotorcraft Flight Manual – General	Flight Manual Supplement	X	
29.1583(c)	2	Operating Limitations – Weight and Loading Information	Flight Manual Supplement	X	
29.1585	2	Operating Procedures	Flight Manual Supplement	X	
29.1587	2	Performance Information	Flight Manual Supplement	X	
29.1589	2	Loading Information	Flight Manual Supplement & Placard	X	Placard installed on basket lid

MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD751, Rev. 0

1. NAME AND ADDRESS OF APPLICANT:		2. IDENTIFICATION OF PRODUCT				
AERO Design Ltd. 2013 - 39th Avenue NE Calgary, Alberta T2E 6R7		MAKE: Bell		MODEL: 205A-1, 212, 412		
ALL CORRESPONDANCE TO: AERO Design Ltd. 2013 - 39th Avenue NE Calgary, Alberta T2E 6R7		SERIAL No.: 30002, 30009		REGISTRATION: C-FFJY, C-FTGK		
3. REQUEST FOR:						
A. SUPPLEMENTAL TYPE CERTIFICATE (STC)		<input type="checkbox"/>				
B. STC/STA REVISION		<input type="checkbox"/> STC/STA No.				
C. LIMITED SUPPLEMENTAL TYPE CERTIFICATE (LSTC)		<input checked="" type="checkbox"/> C-07-1032				
D. LIMITED STC/STA REVISION		<input type="checkbox"/> LSTC/LSTA No.				
E. F.A.A. SUPPLEMENTAL TYPE CERTIFICATE		<input type="checkbox"/>				
F. F.A.A. STC REVISION		<input type="checkbox"/> STC No.				
G. FAMILIARIZATION OF F.A.A. STC		<input type="checkbox"/> STC No.				
H. REPAIR DESIGN APPROVAL (RDC)		<input type="checkbox"/>				
I. PARTS DESIGN APPROVAL (PDA)		<input type="checkbox"/>				
4. TITLE OF MODIFICATION OR REPAIR: Quick Release Cargo Basket Installation						
5. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR: Installation of Cargo Basket on right side of the helicopter. The mounting provisions are aluminum and steel beams that attach to the existing hard points below the cabin of the helicopter. The Cargo Basket can be installed and removed from the beams without tools.						
6. APPLICABLE TYPE APPROVAL (TA) OR TYPE CERTIFICATE (TC) DOCUMENTS:						
A. TA NO. H-86 B. TC No. H1SW C. OTHER						
7. PROPOSED BASIS OF APPROVAL:						
A. SAME AS TA <input checked="" type="checkbox"/> B. SAME AS TC <input type="checkbox"/> C. OTHER <input type="checkbox"/> (Please specify)						
8. DOCUMENTATION CHECKLIST		REQUIRED		FOR DOT USE ONLY		
				RECEIVED		
		YES	NO	YES	NO	DATE
COMPLIANCE PROGRAM		X				
MASTER DRAWING LIST		X				
FLIGHT MANUAL SUPPLEMENT		X				
MAINTENANCE MANUAL SUPPLEMENT			X			
INSTRUCTIONS FOR CONTINUING AIRWORTHINESS		X				
ENGINEERING REPORTS		X				
DESIGN DRAWINGS			X			
MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS		X				
ELECTRICAL LOAD ANALYSIS			X			
DRAFT STC, LSTC OR RDA		X				
WEIGHT AND MOMENT CHANGE		X				
FLIGHT TEST DATA		X				
OTHER (Specify)						
9. APPLICANT'S REMARKS:						
10. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4.						
PER 		Consultant		02 November, 2007		
SIGNATURE OF APPLICANTS		TITLE		DATE		
11.						
SIGNATURE OF REGIONAL ENGINEER		DATE				

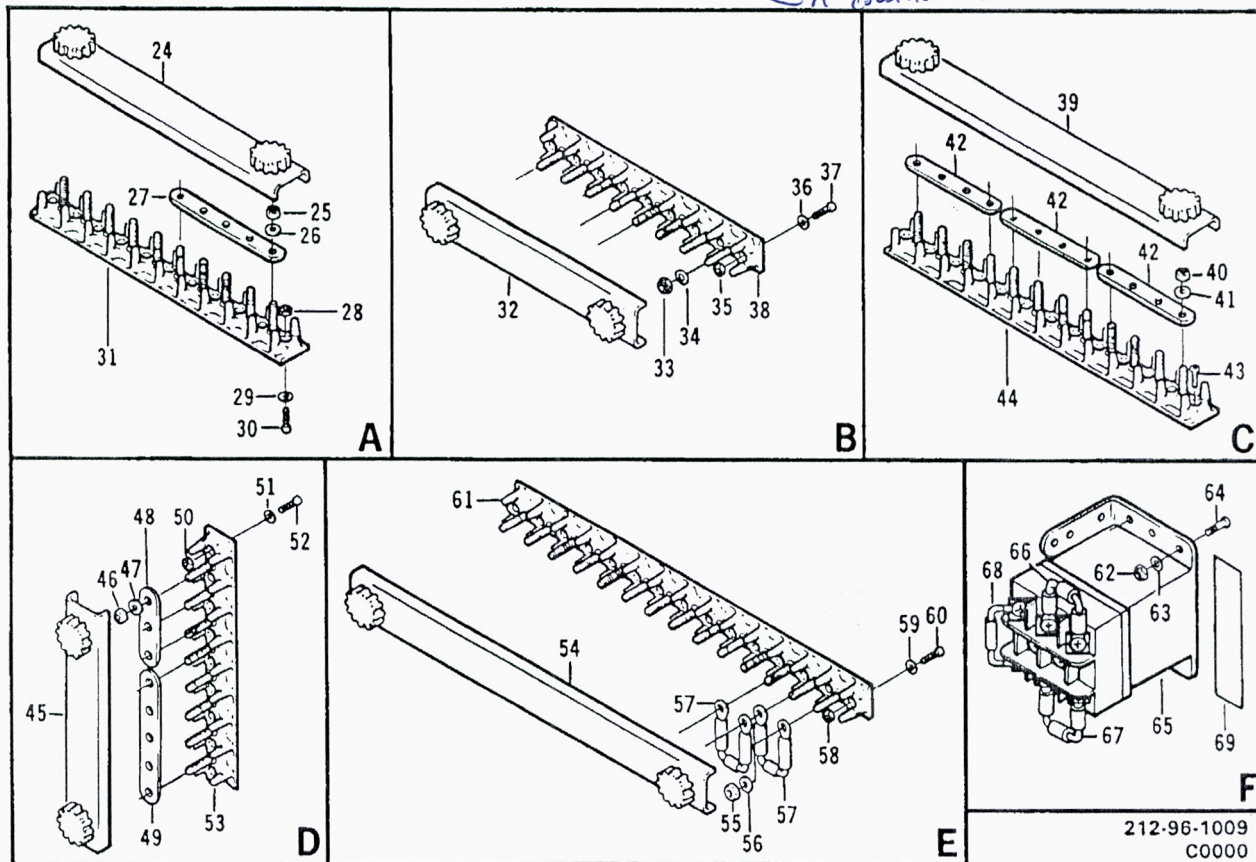
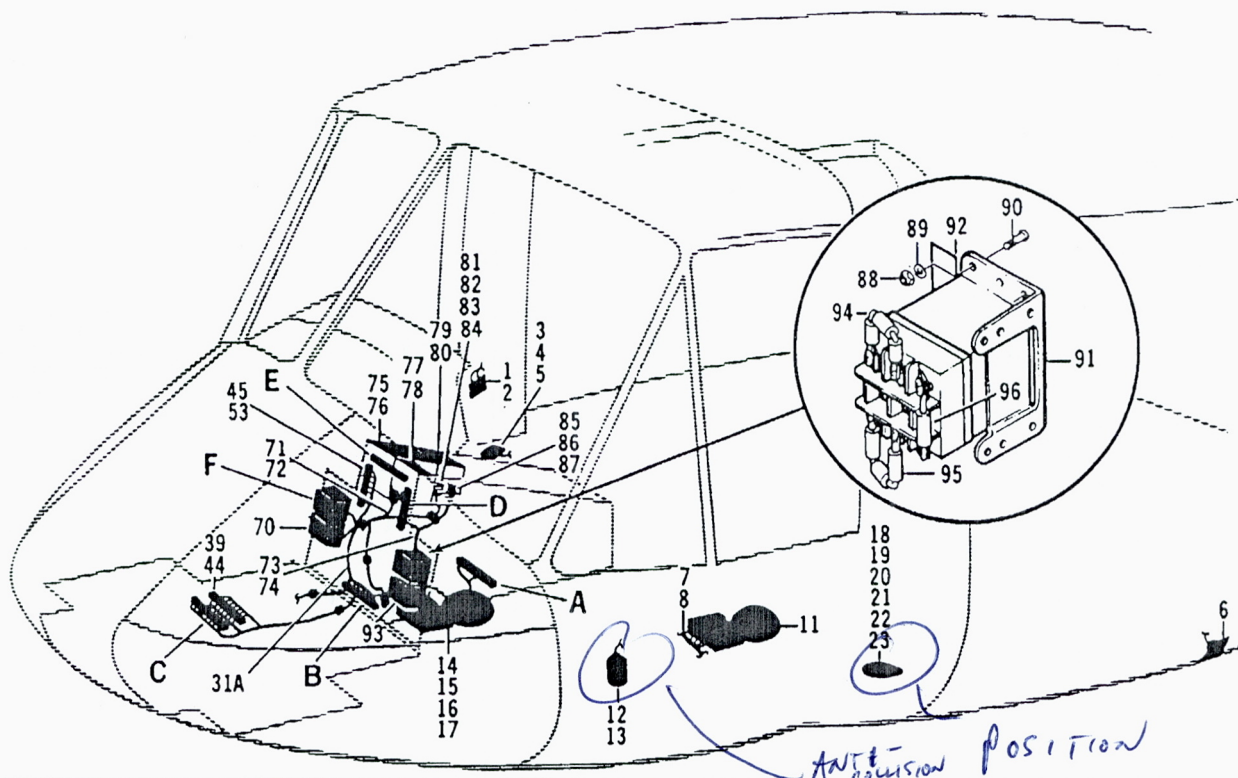


Figure 96-9. Electrical installation, forward section (30504 thur 30596, 30604 thur 30610)



Figure 96-12. Electrical installation, forward section (Sheet 1 of 5)

212-96-1012-1
C0000

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 96-12. Electrical installation, forward section (Cont'd)			
7	DELETED			
8	MS24693S26	..SCREW (REPLACES BY MS24693-S26)	6		
8	MS24693-S26	..SCREW (REPLACES MS24693S26)	6	1	
8A	AN3033-12	..LIGHT ASSY, LH	1	1	
9	AN3033-13	..LIGHT ASSY, RH	1	1	
10	AN3042-1	..LIGHT LENS, RED, LH	1	1	
10	AN3042-2	..LIGHT LENS, GREEN, RH	1	1	
11	ASA7512	..LAMP (REPLACES BY MS25309-7512)	1		
11	MS25309-7512	..LAMP (REPLACES ASA7512) (REPLACES BY M6363/2-2) ..	1		
11	M6363/2-2	..LAMP (REPLACES MS25309-7512)	1	1	
12	212-075-649-001	..CABLE ASSY	1		
13	MS3106R20-16S	..CONNECTOR (REPLACES BY 30-051R20-16S)	1		
13	30-051R20-16S	..CONNECTOR (REPLACES MS3106R20-16S)	1	0	
		(ALTERNATE PART)			
13	MS3456W20-16S	..CONNECTOR	1	1	
14	212-075-139-001	..LIGHT ASSY, LANDING (SEE FIG. 13 FOR BREAKDOWN) ...	1	1	
15	MS35206-228	..SCREW	5	1	
16	AN960PD6L	..WASHER (REPLACES BY AN960JD6L)	5		
16	AN960JD6L	..WASHER (REPLACES AN960PD6L) (REPLACES BY	5	1	
		NAS1149DN616J)			
16	NAS1149DN616J	..WASHER (REPLACES AN960JD6L)	5	1	
17	44410-2-24	..STROBE LIGHT, LOWER (S/N 30504 THRU 31294)	1	1	
		(REPLACES BY 70285-01 AND 01-0770285-11)			
17	70285-01	..STROBE LIGHT, LOWER (S/N 30504 THRU 31294)	1		
		(REPLACES 44410-2-24) (REPLACES BY 01-0770285-11)			
17	01-0770285-11	..STROBE LIGHT, LOWER (REPLACES 44410-2-24 AND	1		
		70285-01) (REPLACES BY 01-0770285-21)			
17	01-0770285-21	..STROBE LIGHT, LOWER (REPLACES 44410-2-24 AND	1		
		70285-01) (REPLACES 01-0770285-11)			
18	MS27039-0808	..SCREW	4	1	
19	AN960PD8L	..WASHER (REPLACES BY AN960JD8L)	4		
19	AN960JD8L	..WASHER (REPLACES AN960PD8L) (REPLACES BY	4	1	
		NAS1149DN816J)			
19	NAS1149DN816J	..WASHER (REPLACES AN960JD8L)	4		
20	G6250-4	..SEARCHLIGHT, CONTROLLABLE (REPLACES BY G-6250-4) ..	1	0	
20	G-6250-4	..SEARCHLIGHT, CONTROLLABLE (REPLACES G6250-4)	1	1	
21	4580	..LAMP	1	1	
22	NAS679A04	..NUT (REPLACES BY MS21042L04)	4	1	
22	MS21042L04	..NUT (REPLACES NAS679A04)	4	1	
23	AN960PD4L	..WASHER (REPLACES BY AN960JD4L)	4		
23	AN960JD4L	..WASHER (REPLACES AN960PD4L) (REPLACES BY	4	1	
		NAS1149DN416J)			
23	NAS1149DN416J	..WASHER (REPLACES AN960JD4L)	4	1	
24	MS35206-216	..SCREW	4	1	
25	212-075-649-007	..CABLE ASSY	1		
26	MS3120E18-32S	..CONNECTOR	1	1	
26A	M39029/32-259	..CONTACT (POST TB 212-93-145)	4	1	
27	MS3126E12-10S	..CONNECTOR	2	1	

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 96-9. Electrical installation, forward section (30504 thur 30596, 30604 thur 30610)			
	212-075-008-001	ELECTRICAL INSTL, FORWARD SECTION (S/N 30504 THRU . . 30553) (SEE FIG. 1,2,3,4,7,15,17 FOR BALANCE OF BREAKDOWN)	REF		
	212-075-008-005	ELECTRICAL INSTL, FORWARD SECTION (S/N 30554 THRU . . 30596, 30604 THRU 30610) (SEE FIG. 1,2,3,4,7,15,17 FOR BALANCE OF BREAKDOWN)	REF		
1	A5299	.LIGHT ASSY	2	1	
2	334	.LAMP	2	1	
3	MS24693S26	.SCREW (REPLACES BY MS24693-S26)	3		
3	MS24693-S26	.SCREW (REPLACES MS24693S26)	3	1	
4	AN3033-13	.LIGHT ASSY	1	1	
5	ASA7512	.LAMP (REPLACES BY M6363/2-2 AND MS25309-7512) . . .	1		
5	MS25309-7512	.LAMP (REPLACES ASA7512) (REPLACES BY M6363/2-2) .	1		
5	M6363/2-2	.LAMP (REPLACES ASA7512 AND MS25309-7512)	1	1	
6	22150-303	.LIGHT ASSY	2	1	
7	212-075-649-001	.CABLE ASSY	1		
8	MS3106R20-16S	.CONNECTOR (REPLACES BY 30-051R20-16S)	1		
8	30-051R20-16S	.CONNECTOR (REPLACES MS3106R20-16S)	1	0	
9	DELETED			
10	DELETED			
11	212-075-139-001	.LIGHT ASSY, LANDING (SEE FIG. 13 FOR BREAKDOWN) . . .	1	1	
12	MS35206-228	.SCREW	1	1	
13	44410-2-24	.STROBE LIGHT, LOWER (REPLACES BY 70285-01)	1	1	
13	70285-01	.STROBE LIGHT, LOWER (REPLACES 44410-2-24) (REPLACES BY 01-0770285-11)	1		
13	01-0770285-11	.STROBE LIGHT, LOWER (REPLACES 70285-01) (REPLACES BY 01-0770285-21)	1		
13	01-0770285-21	.STROBE LIGHT, LOWER (REPLACES 01-0770285-11)	1		
14	MS35206-245	.SCREW	4	1	
15	AN960PD8L	.WASHER (REPLACES BY AN960JD8L)	4		
15	AN960JD8L	.WASHER (REPLACES AN960PD8L) (REPLACES BY NAS1149DN816J)	4	1	
15	NAS1149DN816J	.WASHER (REPLACES AN960JD8L)	4		
16	G6250-4	.SEARCHLIGHT, CONTROLLABLE (REPLACES BY G-6250-4) .	1	0	
16	G-6250-4	.SEARCHLIGHT, CONTROLLABLE (REPLACES G6250-4)	1	1	
17	4580	.LAMP	1	1	
18	212-075-649-005	.CABLE ASSY	1		
19	MS3106R10SL3S	.CONNECTOR (REPLACES BY 30-051R10SL-3S, MS3456W10SL3S AND MS3456W10SL-3S)	1	0	
19	30-051R10SL-3S	.CONNECTOR (REPLACES MS3106R10SL3S) (REPLACES BY . MS3456W10SL03S AND MS3456W10SL-3S)	1		
19	MS3456W10SL3S	.CONNECTOR (REPLACES MS3106R10SL3S AND 30-51R10SL-3S) (REPLACES BY MS3456W10SL-3S)	1	0	
19	MS3456W10SL-3S	.CONNECTOR (REPLACES MS3106R10SL3S, 30-051R10SL-3S AND MS3456W10SL3S)	1	1	
20	MS3126E14-15S	.CONNECTOR	1	1	
21	MS24693S26	.SCREW (REPLACES BY MS24693-S26)	3		
21	MS24693-S26	.SCREW (REPLACES MS24693S26)	3	1	
22	AN3033-12	.LIGHT ASSY	1	1	

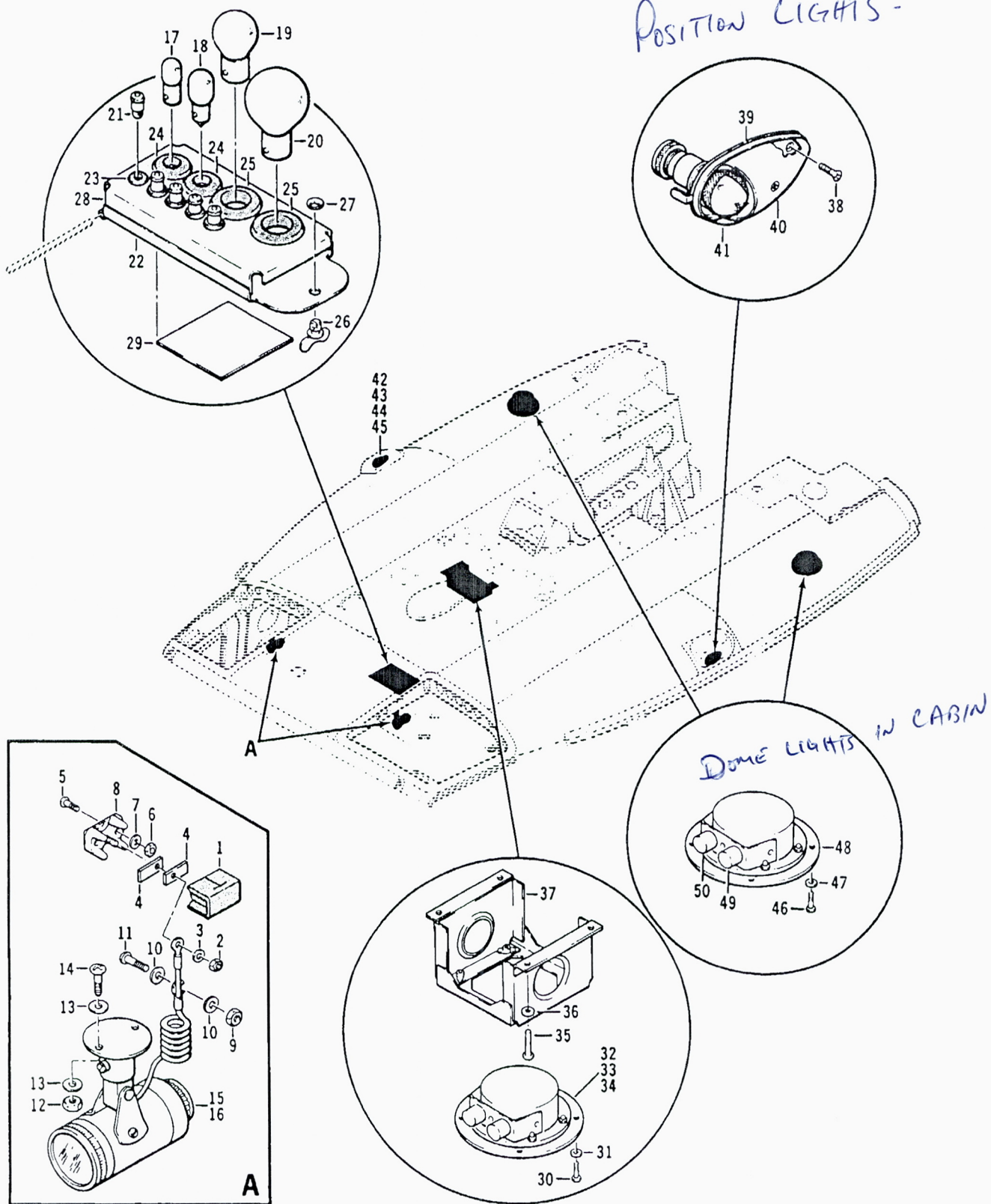


Figure 96-7. Electrical installation, forward section (30504 thru 30596, 30604 thru 30610)

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 96-7. Electrical installation, forward section (30504 thru 30596, 30604 thru 30610)			
	212-075-008-001	ELECTRICAL INSTL, FWD SECTION (S/N 30504 THRU 30553) (SEE FIG. 1,2,3,4,9,15,17 FOR BALANCE OF BREAKDOWN)	REF		
	212-075-008-005	ELECTRICAL INSTL, FWD SECTION (S/N 30554 THRU 30596, 30604 THRU 30610) (SEE FIG. 1,2,3,4,9,15,17 FOR BALANCE OF BREAKDOWN)	REF		
	212-075-105-001	.CONSOLE INSTL, OVERHEAD (S/N 30504 THRU 30553) . . . (SEE FIG. 21 FOR BREAKDOWN)	1		
	212-075-105-007	.CONSOLE INSTL, OVERHEAD (S/N 30554 THRU 30596, . . . 30604 THRU 30610) (SEE FIG. 21 FOR BREAKDOWN)	1		
1	397-1	.COVER, TERMINAL BOARD (REPLACED BY 30-020-1)	2		
1	30-020-1	.COVER, TERMINAL BOARD (REPLACES 397-1)	2		
2	NAS679A06	.NUT (REPLACED BY MS21042L06)	2		
2	MS21042L06	.NUT (REPLACES NAS679A06)	2		
3	AN961-6T	.WASHER	2		
4	MS25227-1A	.STRIP (REPLACED BY MS3373-A1)	4		
4	MS3373-A1	.STRIP (REPLACES MS25227-1A)	4		
5	MS35206-215	.SCREW	4		
6	NAS679A04	.NUT (REPLACED BY MS21042L04)	4		
6	MS21042L04	.NUT (REPLACES NAS679A04)	4		
7	AN960PD4L	.WASHER (REPLACED BY AN960JD4L)	4		
7	AN960JD4L	.WASHER (REPLACES AN960PD4L)	4		
8	MS27212-1-1	.TERMINAL BOARD	2		
9	NAS679A06	.NUT (REPLACED BY MS21042L06)	2		
9	MS21042L06	.NUT (REPLACES NAS679A06)	2		
10	AN960D6L	.WASHER	4		
11	MS35206-228	.SCREW	2		
12	NAS679A3	.NUT (REPLACED BY MS21042L3)	4		
12	MS21042L3	.NUT (REPLACES NAS679A3)	4		
13	AN960PD10L	.WASHER (REPLACED BY AN960JD10L)	8		
13	AN960JD10L	.WASHER (REPLACES AN960PD10L)	8		
14	AN520-10R8	.SCREW (REPLACED BY MS35207-263)	4		
14	MS35207-263	.SCREW (REPLACES AN520-10R8)	4		
15	15-0007-43	.LIGHT ASSY, COCKPIT (REPLACED BY 90-004-1)	2		
15	90-004-1	.LIGHT ASSY, COCKPIT (REPLACES 15-0007-43)	2		
16	MS25231-313	.LAMP	1		
17	MS25231-313	.LAMP	1		
18	MS25069-1495	.LAMP	1		
19	MS25232-307	.LAMP (REPLACED BY MS35478-307)	1		
19	MS35478-307	.LAMP (REPLACES MS25232-307)	1		
20	MS25235R311	.LAMP	1		
21	MS25237-327	.LAMP (REPLACED BY M6363/8-5)	5		
21	M6363/8-5	.LAMP (REPLACES MS25237-327)	5		
22	204-075-144-009	.CONTAINER ASSY, SPARE LAMPS	1		
23	MS35489-4	.GROMMET	5		
24	AN931-6-10	.GROMMET (REPLACED BY MS35489-11)	2		
24	MS35489-11	.GROMMET (REPLACES AN931-6-10)	2		
25	MS35489-17	.GROMMET	2		
26	AW3 1-2T10	.FASTENER (REPLACED BY 50-007W12)	1		

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 96-7. Electrical installation, forward section (30504 thru 30596, 30604 thru 30610) (Cont'd)			
26	50-007W12	..STUD (REPLACES AW3 1-2T10)	1		
27	GH3 1-2	..GROMMET (REPLACED BY 50-009-2)	1		
27	50-009-2	..GROMMET (REPLACES GH3 1-2)	1		
28	204-075-144-005	..PLATE	1		
29	204-075-145-001	..DECAL (SPARE LAMP IDENTIFICATION) (REPLACED BY . . 204-075-145-005)	1		
29	204-075-145-005	..DECAL (SPARE LAMP IDENTIFICATION) (REPLACES 204-075-145-001)	1		
30	MS35206-228	..SCREW	4		
31	AN960D6	..WASHER	4		
32	MS25358-7	..LIGHT ASSY	1		
33	MS25232-307	..LAMP (REPLACED BY MS35478-307)	1		
33	MS35478-307	..LAMP (REPLACES MS25232-307)	1		
34	MS25235R311	..LAMP	1		
35	AN520-10R8	..SCREW (REPLACED BY MS35207-263)	4		
35	MS35207-263	..SCREW (REPLACES AN520-10R8)	4		
36	AN960PD10L	..WASHER (REPLACED BY AN960JD10L)	4		
36	AN960JD10L	..WASHER (REPLACES AN960PD10L)	4		
37	205-075-129-001	..SUPPORT, DOME LIGHT (S/N 30504 THRU 30553)	1		
38	MS24693-S26	..SCREW	3		
39	AN3033-12	..LIGHT ASSY, LH	1		
40	AN3042-1	..LIGHT LENS	1		
41	ASA7512	..LAMP (REPLACED BY MS25309-7512 AND M6363/2-2)	1		
41	MS25309-7512	..LAMP (REPLACES ASA7512) (REPLACED BY M6363/2-2) . .	1		
41	M6363/2-2	..LAMP (REPLACES ASA7512 AND MS25309-7512)	1		
42	MS24693-S26	..SCREW	3		
43	AN3033-13	..LIGHT ASSY, RH	1		
44	AN3042-2	..LIGHT LENS	1		
45	ASA7512	..LAMP (REPLACED BY MS25309-7512 AND M6363/2-2)	1		
45	MS25309-7512	..LAMP (REPLACES ASA7512) (REPLACED BY M6363/2-2) . .	1		
45	M6363/2-2	..LAMP (REPLACES ASA7512 AND MS25309-7512)	1		
46	MS35206-228	..SCREW	8		
47	AN960PD6L	..WASHER (REPLACED BY AN960JD6L)	8		
47	AN960JD6L	..WASHER (REPLACES AN960PD6L)	8		
48	MS25358-7	..LIGHT ASSY	2		
49	MS25232-307	..LAMP (REPLACED BY MS35478-307)	1		
49	MS35478-307	..LAMP (REPLACES MS25232-307)	1		
50	MS25235R311	..LAMP	1		



**BELL
HELICOPTER COMPANY**

POST OFFICE BOX 482 • FORT WORTH TEXAS 76101 A **Textron** COMPANY

SERVICE LETTER

NO. 205A-39

1 August 1969
35:OES:rb-3803

TO: All 205A/205A-1 Helicopter Operators
SUBJECT: EXTERNAL LOAD CARRYING HARD POINTS
REASON: Provide information concerning utilization
and location of hard point fittings.

D.E.R. APPROVAL: *SW-122 E. M. Asplund*

HELICOPTERS AFFECTED: All 205A/205A-1 Helicopters

ACCOMPLISHMENT: N/A

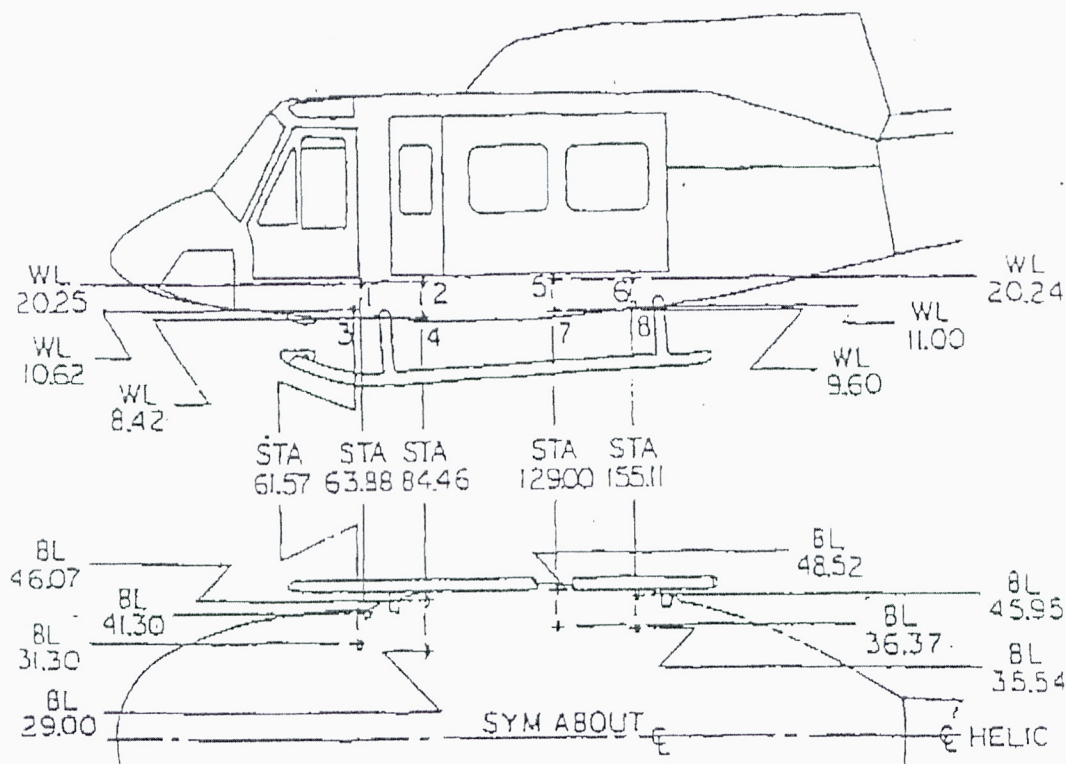
DESCRIPTION:

1. There are sixteen external load carrying hard point fittings (eight to a side) on the 205A/205A-1 helicopter. One pair of the fittings are located at each of the fuselage stations 61, 84 and 155. Two (2) sets of the aft hard point fittings are removed from fuselage station 129 due to the passenger step installation. These predrilled fittings are located in the loose equipment or stowed under the cabin floor on the left hand and right hand access door assemblies, P/N 205-032-142 -39 and -40. When they are required, it will be necessary to remove the passenger steps to install these fittings.
2. These fittings are designed for the following limit loads acting simultaneously. Upper hard points vertical 3060 pounds, side (lateral) 1310 pounds; lower hard points vertical 1560 pounds, side (lateral) 1310 pounds.
3. In addition to the above loads, each fitting is designed to a limit forward or aft load of 1700 pounds.
4. In order to assist the customer in attaching external loads, Bell Helicopter has an external stores support kit P/N 205-706-013-11 available through the Spares Department.

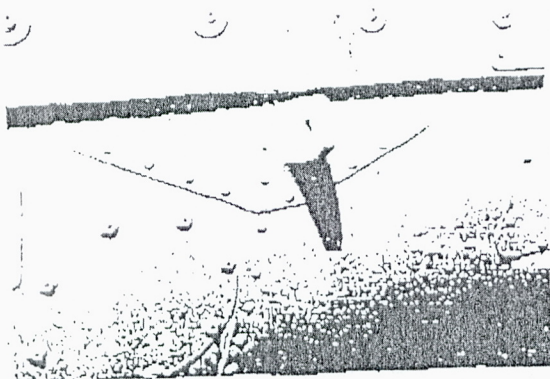
ENGINEERING *Joe R. Beebe*
DO NOT REMOVE FROM THIS OFFICE
Wm. J. Diehl
Manager Service

EXTERNAL HARDPOINTS: MODELS 205, 212, 214B & 412

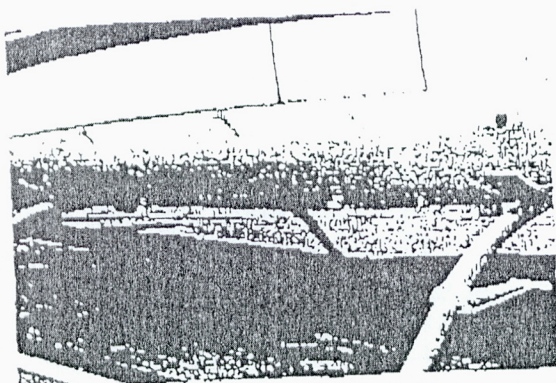
FUSELAGE LOCATIONS AND ALLOWABLE ULTIMATE LOADS



CAUTION: Helicopter C.G. limits must be maintained for all equipment or stores configurations which attach to any or all of these hard-points.



Provisions to attach special equipment externally on the lower fuselage are provided as part of the basic airframe. Nine hard point fittings are mounted on each side. The most forward hard point is part of the jacking/mooring point. Four fittings make up the forward cluster and four make up the aft cluster.



Each cluster is designed to carry a load of 340 kilograms, 750 pounds, with the center of gravity between the pairs and about 38 centimeters, 15 inches outboard of the widest part of the fuselage.

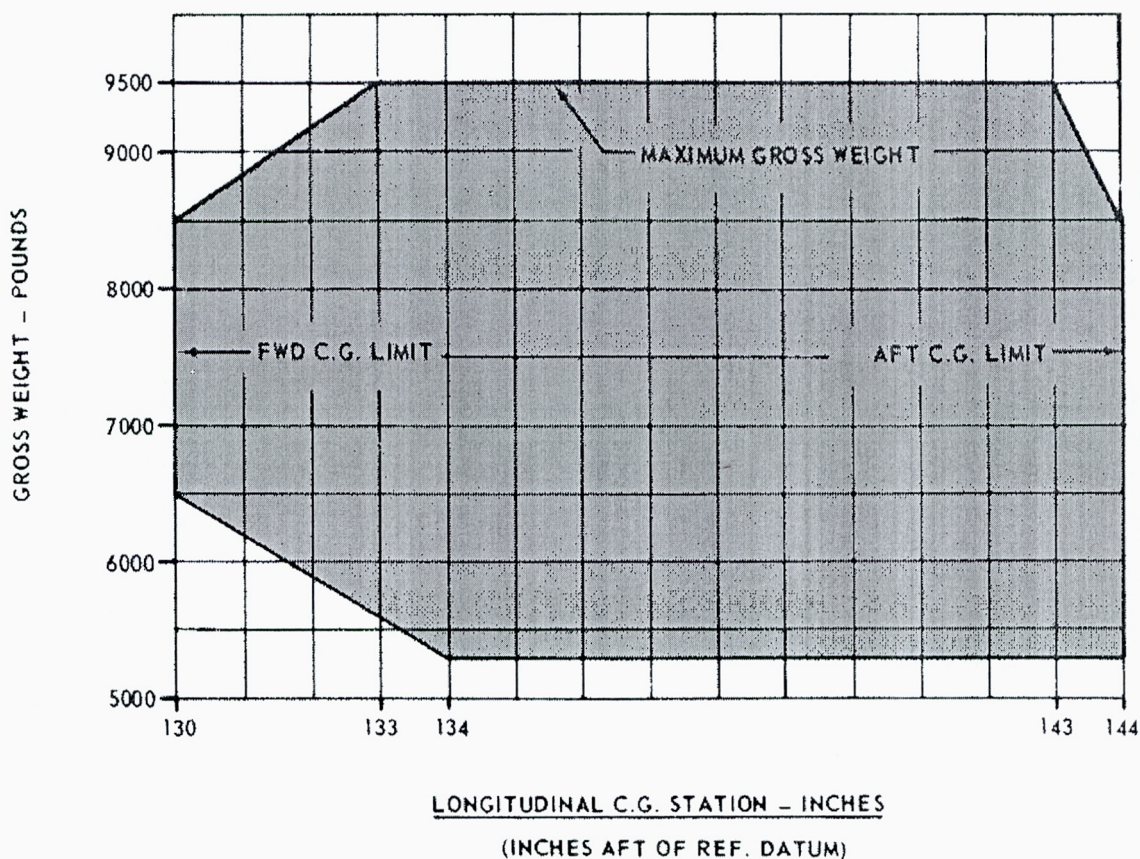
CENTER OF GRAVITY LIMITATIONS

Center of gravity limits are from Station 130.0 to Station 144.0. The center of gravity operational range is variable, depending upon gross weight, and shall be computed from the weight and balance data.

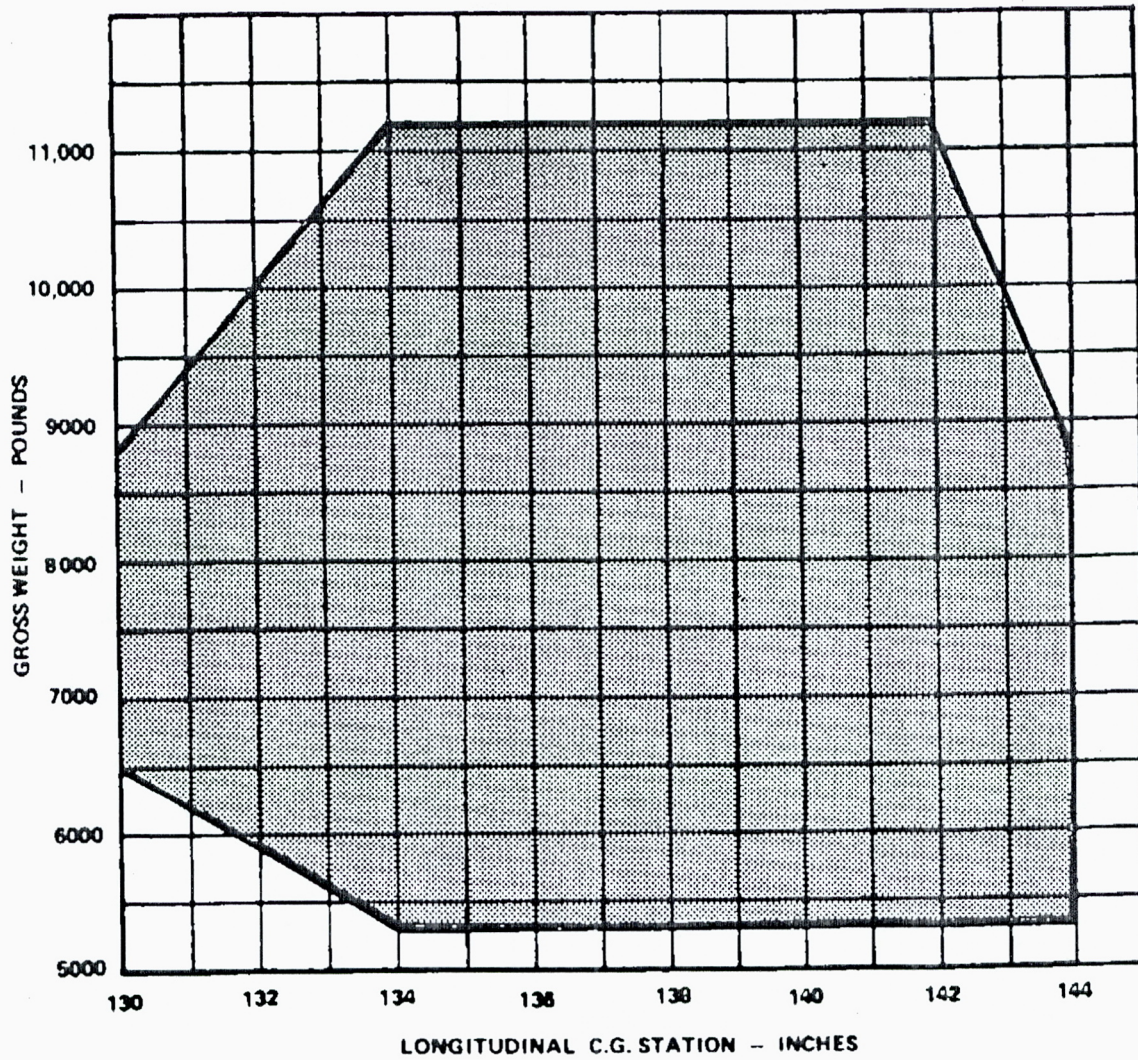
Note

Station 0 (datum) is located 7.60 inches aft of the most forward point of the fuselage cabin nose section.

Maximum asymmetric center of gravity limits is 4.7 inches from fuselage center line to the left and 6.5 inches to the right.



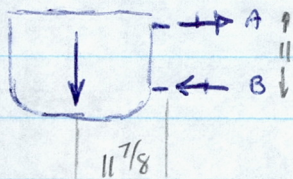
CENTER OF GRAVITY VS GROSS WEIGHT



212VFR-FM-1-2

Figure 1-2. Gross weight center of gravity chart

$$P = 669 \text{ lb.}$$

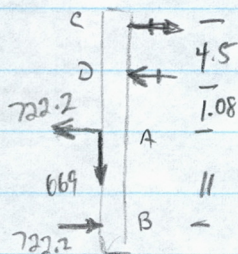


Shear taken @ A

$$\sum M_A = 0 \quad -P \times 11.875 + R_B \times 11$$

$$R_{Bx} = 722.2 \text{ lb.}$$

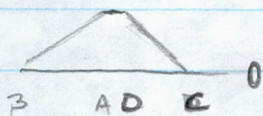
$$R_{Ax} = 722.2 \text{ lb.} \quad R_{Ay} = 669 \text{ lb.}$$



$$+\circlearrowleft \sum M_C = 0 \quad R_D \times 4.5 + 722.2 \times 5.58 + 722.2 \times 16.58 - 669 \times 2$$

$$R_{Dx} = 2063.16 \text{ lb.}$$

$$R_{Cx} = 2063.16 \text{ lb.}$$



$$M_A = 7944.2$$

$$M_D = 7944.2$$

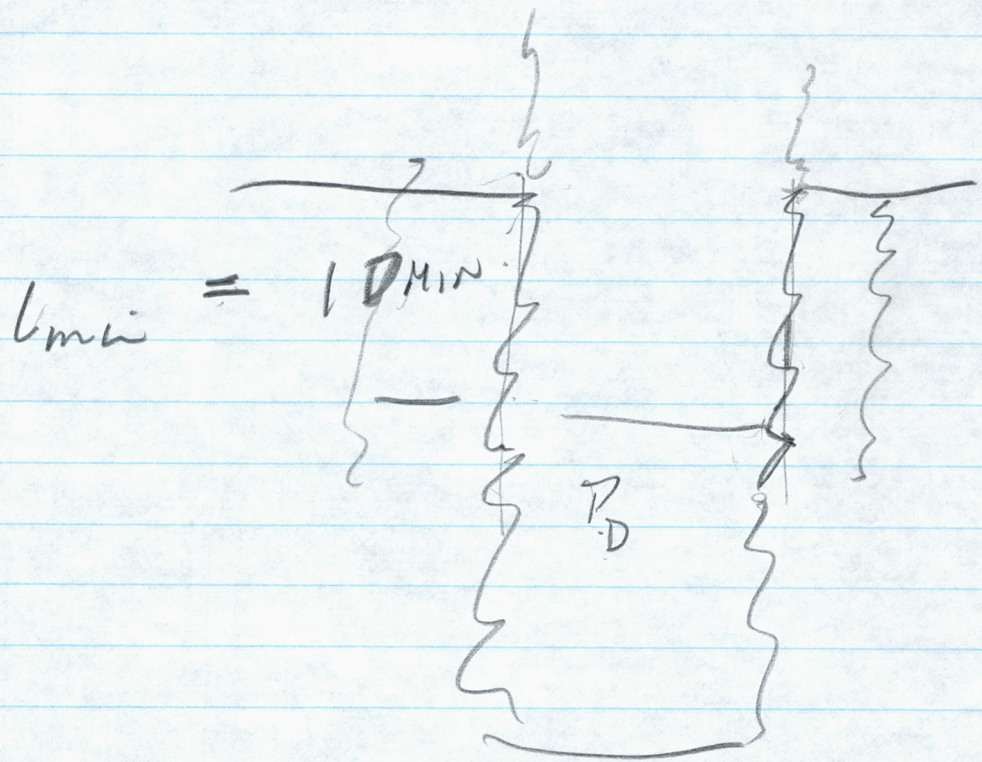
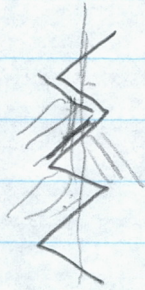
$$F_b = \frac{M_y}{I} = \frac{7944.2 \times 1}{0.28}$$

$$F_b = 28.4 \text{ ksi}$$

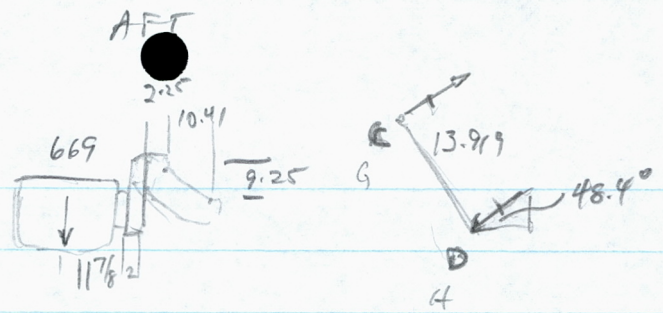
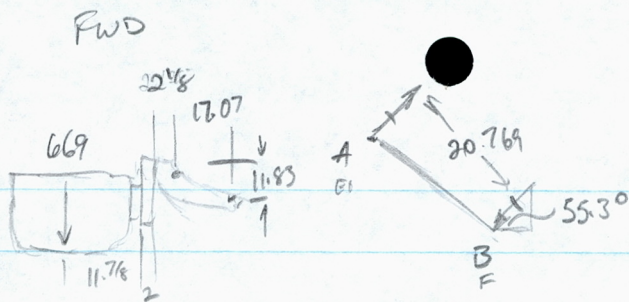
55 ksi tube OK

$$UTS = 74 \text{ ksi}$$

$$YTS = 29 \text{ ksi}$$



$$\cancel{T} \times A = \pi D_D \times \frac{1}{2} L_{min} = \text{Shear Stress}$$



$$\Sigma M_A = 0 \quad 669 \times 16 = R_B \times 20.769$$

$$R_B = 515.4 \text{ lb.}$$

$$R_{Bx} = 293.6 \text{ lb} \quad R_{By} = 423.6 \text{ lb}$$

$$\Sigma M_C = 0 \quad 669 \times 16.125 = R_D \times 13.919$$

$$R_D = 775.1 \text{ lb.}$$

$$R_{Dx} = 516.1 \text{ lb} \quad R_{Dy} = 581.5 \text{ lb.}$$

$$\Sigma F_y = 0 \quad 669 + 423.6 = R_{Ay}$$

$$R_{Ay} = 1092.6 \text{ lb.}$$

$$\Sigma F_y = 0 \quad 669 + 581.5 = R_{Cy}$$

$$R_{Cy} = 1250.5 \text{ lb.}$$

$$\Sigma F_x = 0 \quad 293.6 = R_{Ax}$$

$$R_{Ax} = 293.6 \text{ lb.}$$

$$\Sigma F_x = 0 \quad 516.1 = F_{Cx}$$

$$F_{Cx} = 516.1 \text{ lb.}$$

FITTING LIMIT LOADS

UPPER 3060 vertical 1700 FWD/AFT
1310 lateral

LOWER 1560 vertical 1700 FWD/AFT
1310 lateral

BELL SERVICE LETTER
205A-39

20.769

F 20 $\frac{13}{16}$ " ϕ $5\frac{1}{16}$ " Both

R 13 $\frac{29}{32}$ " ϕ $1\frac{1}{4}$ " Both

10 x 40088-19

49 $\frac{21}{32}$ each

8.7 day.

Auto Diepen

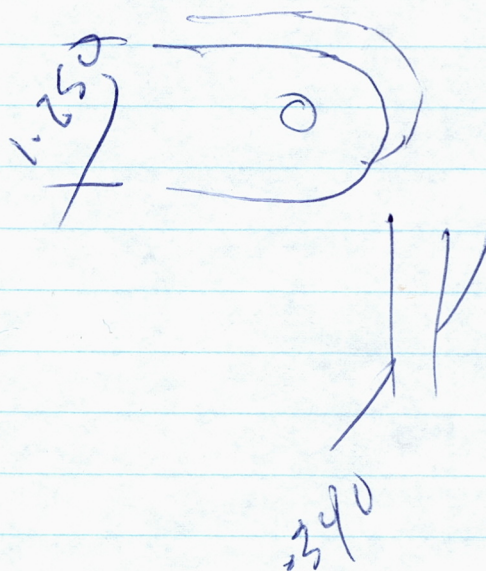
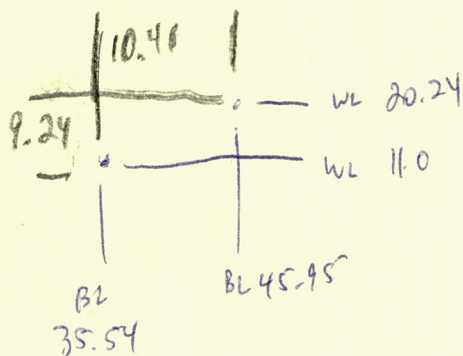
~~PR 7038~~

Fax Ro

Stap is in de Shippers Supply

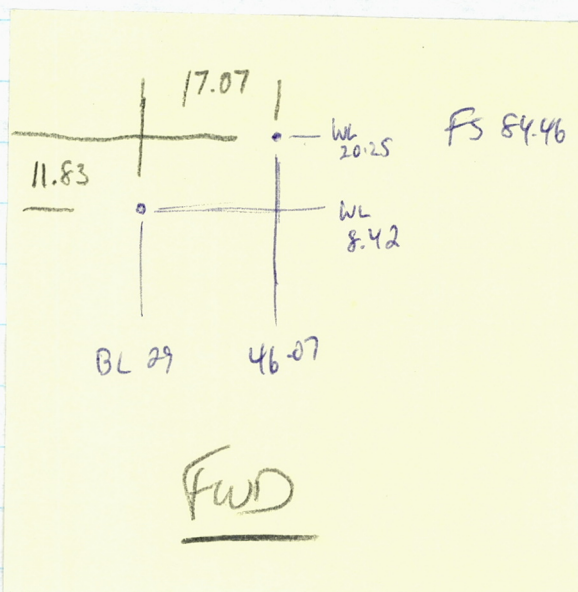
AFT

FS 185.11



23.5 Fwd. 675198

16.5 AFT 75199



FWD

$V_{NE} = 130 \text{ kts}$ INDICATED VFR @ 7500 ft.

$V_{NE} = 120 \text{ kts}$ IFR/VFR

Unloaded canopy, ER for 212 Basket.

$V_{NE} = 140 \text{ kts}$ 412. all s/w.